

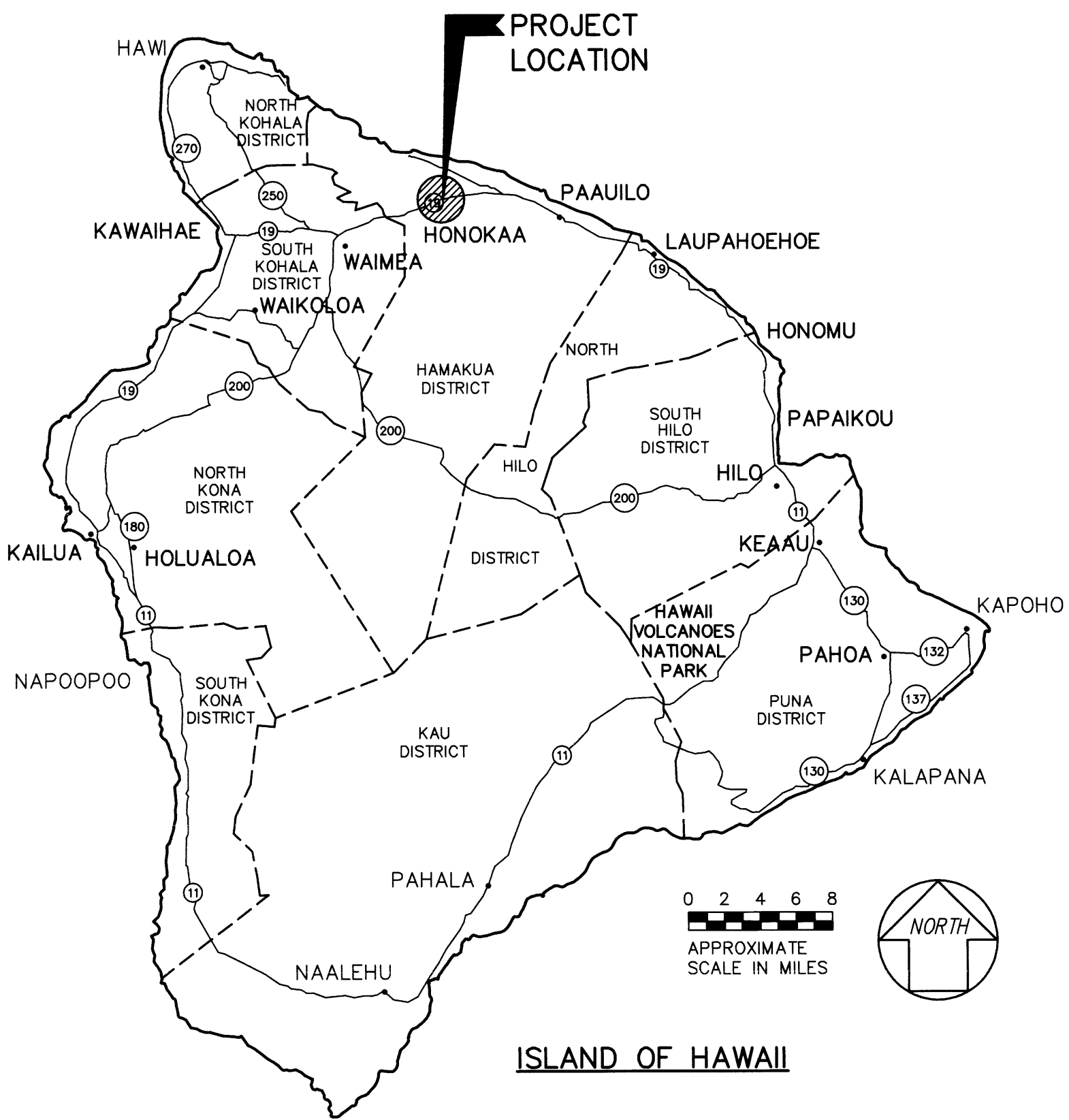
HONOKAIA NON-POTABLE WATER SYSTEM

HONOKAIA, HONOKAA, ISLAND OF HAWAII

OWNER / DEVELOPER: DEPARTMENT OF HAWAIIAN HOME LANDS

HALE KALANIANA'OLE
91-5420 KAPOLEI PARKWAY
KAPOLEI, HAWAII 96707

TAX MAP KEY : (3) 4-6-013: 002-046
SUBDIVISION APPLICATION NO. SUB-2482
IFB-19-HHL-006



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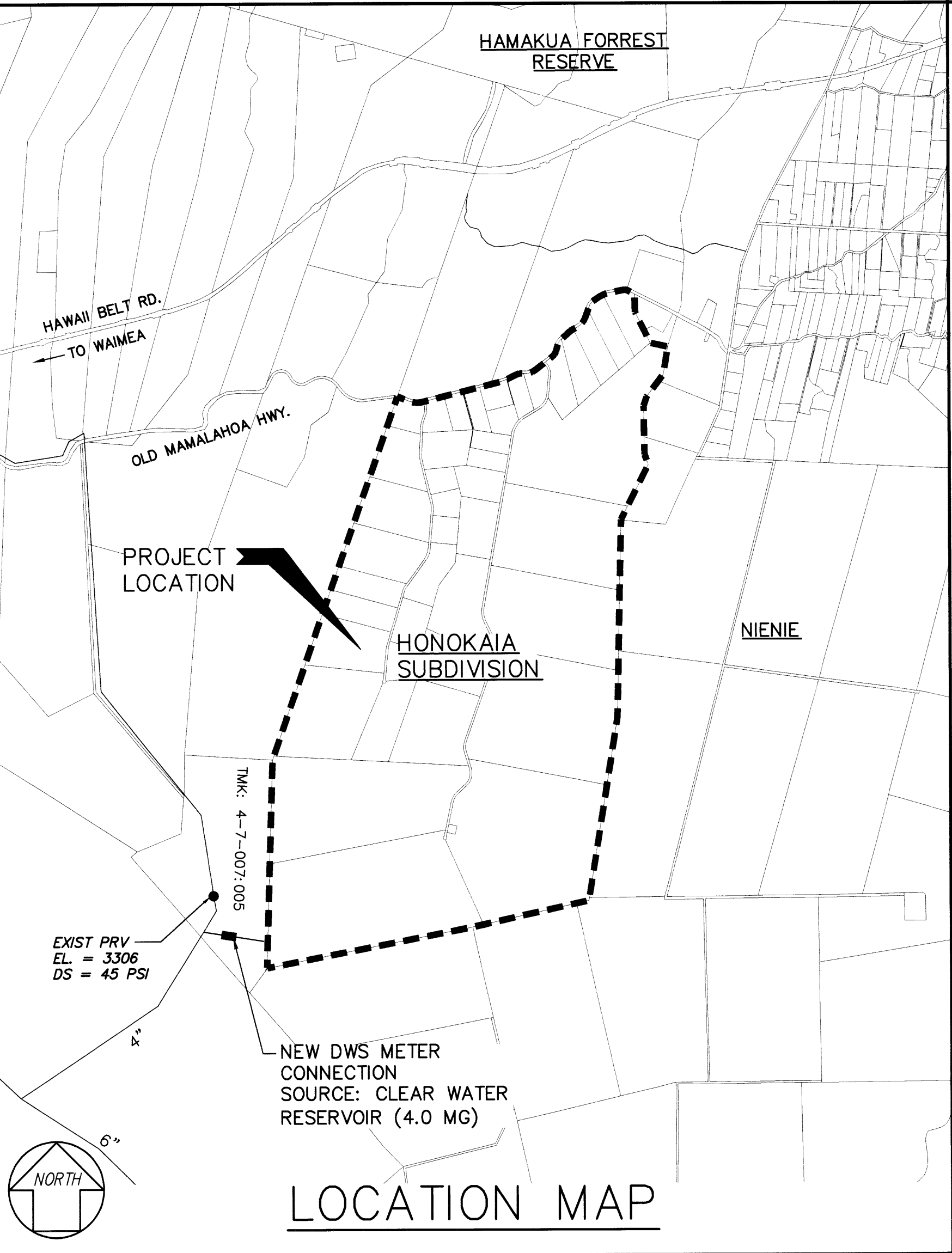

CHAIRMAN, HAWAIIAN HOMES COMMISSION
STATE OF HAWAII
1/22/18
DATE


MANAGER - CHIEF ENGINEER, DEPARTMENT OF WATER SUPPLY
COUNTY OF HAWAII
1/4/18
DATE

N/A
DIRECTOR, DEPARTMENT OF PUBLIC WORKS
COUNTY OF HAWAII
(FOR GRADING PURPOSES ONLY)
DATE

CIVIL ENGINEER
AKINAKA & ASSOCIATES, LTD.
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Plotted on: 10/16/2018
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Notes.dwg

GENERAL NOTES

1. THE PROJECT SCOPE OF WORK INVOLVES INSTALLATION OF A NON-POTABLE WATER SYSTEM TO SERVICE THE HONOKAIA PASTORAL LOTS IN HONOKAIA, HONOKAA, HAWAII. WORK INCLUDES INSTALLATION OF PIPES, A WATER STORAGE TANK, AND CONSTRUCTION OF AN AC PAVEMENT ACCESS ROAD.
2. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND EXISTING CONDITIONS AND SHALL NOTIFY THE CONTRACTING OFFICER IN WRITING, OF ANY DISCREPANCIES BETWEEN THE CONTRACT DOCUMENTS AND EXISTING CONDITIONS PRIOR TO COMMENCING THE WORK. COMMENCEMENT OF WORK SHALL INDICATE THE CONTRACTOR'S ACCEPTANCE OF EXISTING CONDITIONS.
3. ALL ITEMS AND MATERIALS SHOWN ON THE DRAWINGS ARE NEW UNLESS OTHERWISE NOTED.
4. THE CONTRACTOR SHALL OBSERVE, COMPLY WITH, AND ACCOMPLISH ALL WORK IN STRICT ACCORDANCE WITH ALL THE LATEST LOCAL, STATE AND FEDERAL LAWS, REGULATIONS AND STANDARDS HAVING JURISDICTION OVER THIS PROJECT FOR THE PROTECTION OF PUBLIC HEALTH, SAFETY AND ENVIRONMENTAL QUALITY.
5. ALL WORK SHALL CONFORM TO THE UNIFORM BUILDING CODE (UBC) 1997 OR THE LATEST EDITION, AS AMENDED AND ADOPTED BY THE COUNTY OF HAWAII.
6. THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL UTILITIES, WHETHER SHOWN ON THE DRAWINGS OR NOT, AND SHALL BE RESPONSIBLE FOR THE REPAIR OR REPLACEMENT OF THESE ITEMS IN THE EVENT OF DAMAGE DUE TO HIS CONSTRUCTION PRACTICES. THE CONTRACTOR SHALL COORDINATE HIS WORK WITH THE RESPECTIVE UTILITY COMPANIES.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE RESULTING FROM THE PERFORMANCE OF HIS WORK UNDER THIS CONTRACT. ANY AND ALL DAMAGES SHALL BE CORRECTED AT THE CONTRACTOR'S EXPENSE AND TO THE SATISFACTION OF THE CONTRACTING OFFICER. PATCH AND FINISH ALL DAMAGED SURFACES OR AS DIRECTED BY THE CONTRACTING OFFICER.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING BARRIERS AROUND THE CONSTRUCTION AREA AND SAFE DETOUR ROUTES FOR PEDESTRIANS, AS PER THE AMERICANS WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES (ADAAG) 4.1.1(4).
9. THE CONTRACTOR SHALL RE-CONTOUR EXISTING GRADES AS NECESSARY TO CREATE PROPERLY FUNCTIONING SWALES, TRENCH DRAINS, SIDEWALK TRENCH OR PIPE DRAINS FOR CLEAR INLETS AND OUTLETS TO "DAYLIGHT".
10. ALL CONSTRUCTION SHALL BE FULLY ACCESSIBLE AND COMPLY WITH THE ADAAG REQUIREMENTS, SECTION 4.1.1(3).
11. CONSTRUCTION LAYOUT SHALL BE DONE BY A LICENSED CIVIL ENGINEER OR LICENSED SURVEYOR.

PUBLIC HEALTH, SAFETY AND CONVENIENCE NOTES

1. THE CONTRACTOR, AT HIS/HER OWN EXPENSE, SHALL KEEP THE PROJECT AND ITS SURROUNDING AREAS FREE FROM DUST NUISANCE. THE WORK SHALL BE IN CONFORMANCE WITH THE AIR POLLUTION STANDARDS AND REGULATIONS OF THE STATE DEPARTMENT OF HEALTH. THE CITY SHALL REQUIRE SUPPLEMENTARY MEASURES IF REQUIRED.
2. THE CONTRACTOR SHALL PROVIDE, INSTALL, AND MAINTAIN ALL NECESSARY SIGNS, LIGHTS, FLARES, BARRICADES, MARKERS, CONES, AND OTHER PROTECTIVE FACILITIES AND SHALL TAKE ALL NECESSARY PRECAUTIONS FOR THE PROTECTION, CONVENIENCE, AND SAFETY OF THE PUBLIC.
3. THE CONTRACTOR'S ATTENTION IS DIRECTED TO CHAPTER 46 PUBLIC HEALTH REGULATIONS DEPARTMENT OF HEALTH, STATE OF HAWAII, "COMMUNITY NOISE CONTROL" IN WHICH MAXIMUM ALLOWABLE NOISE LEVELS HAVE BEEN SET. IF THE CONSTRUCTION ACTIVITIES FOR THIS PROJECT WILL EXCEED THE ALLOWABLE NOISE LEVELS, THE CONTRACTOR WILL BE REQUIRED TO OBTAIN A PERMIT FROM THE DIRECTOR OF THE DEPARTMENT OF PUBLIC HEALTH. THE CONTRACTOR SHALL OBTAIN A COPY OF CHAPTER 46 AND BECOME FAMILIAR WITH THE NOISE LEVEL RESTRICTIONS AND THE PROCEDURES FOR OBTAINING A PERMIT FOR CONSTRUCTION ACTIVITIES. APPLICATION AND INFORMATION ON VARIANCES ARE AVAILABLE AT THE ENVIRONMENTAL HEALTH SERVICES DIVISION, 591 ALA MOANA BOULEVARD, HONOLULU, HAWAII 96813 OR BY TELEPHONE (586-4700).

CONSTRUCTION NOTES

1. ALL APPLICABLE CONSTRUCTION WORK SHALL BE DONE IN ACCORDANCE WITH THE HAWAII STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, 2005, AND STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION, SEPTEMBER 1984, AS AMENDED, OF THE DEPARTMENTS OF PUBLIC WORKS, CITY AND COUNTY OF HONOLULU, AND THE COUNTIES OF KAUAI, MAUI, AND HAWAII.
2. CONSTRUCTION SHALL BE DONE IN SUBSTANTIAL CONFORMANCE WITH THE SUBSURFACE INVESTIGATION REPORT, "GEOTECHNICAL ENGINEERING EXPLORATION HONOKAIA NON-POTABLE WATER SYSTEM DEPARTMENT OF HAWAIIAN HOME LANDS" DATED FEBRUARY 25, 2015 BY GEOLABS, INC. WHERE APPLICABLE.
3. THE EXISTENCE AND LOCATION OF UNDERGROUND UTILITIES, APPURTENANCES AND STRUCTURES AS SHOWN ON THESE DRAWINGS WERE COMPILED FROM RECORD DRAWINGS PROVIDED BY UTILITY AND GOVERNMENT AGENCIES AND FROM THE ENGINEER'S MEASUREMENTS. THE CONTRACTOR SHALL VERIFY THE LOCATIONS AND DEPTHS OF THE FACILITIES AND EXERCISE PROPER CARE IN EXCAVATING IN THE AREA. THE CONTRACTOR SHALL BE RESPONSIBLE AND SHALL PAY FOR ALL DAMAGES TO THE EXISTING UTILITIES. THE CONTRACTOR SHALL NOT ASSUME THAT WHERE NO UTILITIES ARE SHOWN, THAT NONE EXIST.
4. THE CONTRACTOR SHALL OBTAIN ALL PERMITS AND LICENSES, PAY ALL CHARGES, FEES AND TAXES, GIVE ALL NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, AND REGULATIONS BEARING ON THE CONDUCT OF THE WORK AS DRAWN AND SPECIFIED.

CONSTRUCTION NOTES CONTD.

5. WHEREVER CONNECTIONS OF NEW UTILITIES TO EXISTING UTILITIES ARE SHOWN ON THE PLANS, THE CONTRACTOR SHALL EXPOSE THE EXISTING LINES AT THE PROPOSED CONNECTIONS TO VERIFY THEIR LOCATIONS AND DEPTHS PRIOR TO EXCAVATION FOR THE NEW LINES.
6. THE CONTRACTOR SHALL PROVIDE ACCESS TO AND FROM DRIVEWAYS AND PUBLIC STREETS AT ALL TIMES EXCEPT AS NOTED ON THE PLANS.
7. WHEN TRENCH EXCAVATION IS ADJACENT TO OR UNDER EXISTING STRUCTURES OR FACILITIES, THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROPERLY SHEETING AND BRACING THE EXCAVATION AND STABILIZING THE EXISTING GROUND TO RENDER IT SAFE AND SECURE FROM POSSIBLE SLIDES, CAVE-INS AND SETTLEMENT AND FOR PROPERLY SUPPORTING EXISTING STRUCTURES AND FACILITIES WITH BEAMS, STRUTS OR UNDER-PINNING TO FULLY PROTECT THEM FROM DAMAGE.
8. BACKFILL UNDER EXISTING STRUCTURES OR FACILITIES SHALL BE GRANULAR MATERIAL COMPLETELY PLACED AS SOON AS THE PIPE IS LAID AND TESTED. THE BACKFILL MATERIAL SHALL BE RAMMED WITH PROPER TOOLS UNTIL COMPACTED TO 90 TO 95 PERCENT OF ITS MAXIMUM DENSITY.
9. VERIFY AND CHECK ALL DIMENSIONS AND DETAILS SHOWN ON THE DRAWINGS PRIOR TO THE START OF CONSTRUCTION. ANY DISCREPANCY SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE CONTRACTING OFFICER.
10. THE CONTRACTOR SHALL NOTIFY ALL AGENCIES TO VERIFY THE ACTUAL LOCATIONS OF ALL UTILITIES IN THE PROJECT AREA PRIOR TO EXCAVATION. THE CONTRACTOR SHALL COORDINATE ALL WORK.
11. THE CONTRACTOR SHALL RESTORE TO THEIR ORIGINAL CONDITION ALL IMPROVEMENTS DAMAGED AS A RESULT OF THE CONSTRUCTION, INCLUDING PAVEMENTS, EMBANKMENTS, CURBS, SIGNS, LANDSCAPING, STRUCTURES, UTILITIES, WALLS, FENCES, ETC. UNLESS PROVIDED FOR SPECIFICALLY IN THE PROPOSAL, DEMOLITION AND RESTORATION OF EXISTING ITEMS SHALL BE INCIDENTAL AND INCLUDED WITHIN THE AMOUNT PAID FOR UNCLASSIFIED TRENCH EXCAVATION.
12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPLACING/RECONSTRUCTING ALL CONCRETE CURBS AND GUTTERS, AND SIDEWALKS DAMAGED DURING CONSTRUCTION.
13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONFORMANCE WITH THE APPLICABLE PROVISIONS OF THE WATER QUALITY AND WATER POLLUTION CONTROL STANDARDS CONTAINED IN HAWAII ADMINISTRATIVE RULES, TITLE II, CHAPTER 54, "WATER QUALITY STANDARDS" AND TITLE II, CHAPTER 55, "WATER POLLUTION CONTROL". BEST MANAGEMENT PRACTICES SHALL BE EMPLOYED AT ALL TIMES DURING CONSTRUCTION.
14. NO CONTRACTOR SHALL PERFORM ANY CONSTRUCTION OPERATION SO AS TO CAUSE FALLING ROCKS, SOIL OR DEBRIS IN ANY FORM TO FALL, SLIDE OR FLOW INTO EXISTING CITY DRAINAGE SYSTEMS, OR ADJOINING PROPERTIES, STREETS OR NATURAL WATER COURSES. SHOULD SUCH VIOLATIONS OCCUR, THE CONTRACTOR MAY BE CITED AND THE CONTRACTOR SHALL IMMEDIATELY MAKE ALL REMEDIAL ACTIONS NECESSARY.
15. THE CONTRACTOR SHALL LAY OUT THE WATERLINE WITH THE PROPOSED ALIGNMENT PRIOR TO CONSTRUCTION. THE CONTRACTOR MAY ELECT TO MODIFY THE ALIGNMENT OF THE WATERLINE WITH THE WRITTEN APPROVAL OF DHHL AND THE LESSEE OVER WHOSE LAND THE CHANGES ARE MADE. ADDITIONAL MATERIAL AND COSTS FOR THESE CHANGES SHALL BE BORNE BY THE CONTRACTOR AND WILL BE CONSIDERED INCIDENTAL TO THE PROJECT.

EROSION CONTROL AND BEST MANAGEMENT PRACTICES (BMP) NOTES

1. DURING CONSTRUCTION, PREVENTIVE MEASURES SHALL BE USED TO CONTROL FORESEEABLE DUST, EROSION OR SEDIMENTATION PROBLEMS WHICH MAY ARISE AS THE JOB PROGRESSES.
2. DRAINAGE SYSTEMS AS SHOWN ON THE CONSTRUCTION PLANS SHALL BE CONSTRUCTED AS EARLY AS PRACTICABLY POSSIBLE.
3. ALL FILL, SUBBASE AND BASE MATERIAL PLACED WITHIN THE ROAD PAVEMENT PRISM SHALL BE SUBSTANTIALLY COMPACTED BY THE END OF THE DAY.
4. THE CONTRACTOR SHALL CONDUCT HIS GRADING OPERATIONS SO THAT EXCAVATION, EMBANKMENT AND IMPORTED MATERIAL SHALL BE DAMPENED WITH WATER DURING HIS GRADING OPERATIONS AT ALL TIMES.
5. WATER TRUCK AND/OR TEMPORARY SPRINKLERS SHALL BE AVAILABLE ON THE JOB SITE AT ALL TIMES TO ENSURE BARE EARTH DOES NOT CREATE A DUST PROBLEM.
6. THE CONTRACTOR SHALL ENSURE THAT ALL TIRES OF CONSTRUCTION VEHICLES ARE SUFFICIENTLY CLEANED OFF SO THAT DIRT OR DEBRIS IS NOT TRACKED OFF THE CONSTRUCTION SITE.
7. PROVIDE A FILTER AT CATCH BASIN AND DRAIN INLET OPENINGS TO PREVENT SEDIMENT FROM ENTERING.
8. THE CONTRACTOR SHALL REMOVE CATCH BASIN AND DRAIN INLET FILTERS DURING TIMES OF ABOVE NORMAL RAINFALL EVENTS AND REPLACE THEM WHEN EVENT HAS PASSED.
9. THE CONTRACTOR SHALL RESTORE ALL EXPOSED AREAS DUE TO CONSTRUCTION ACTIVITIES WITH PERMANENT GRASSING.

WATER NOTES

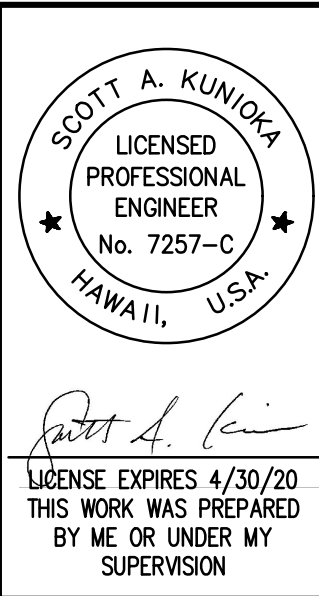
1. ALL MATERIAL AND CONSTRUCTION OF WATER SYSTEM FACILITIES AND APPURTENANCES UP TO THE 1" MASTER METER SHALL BE IN ACCORDANCE WITH THE COUNTY OF HAWAII'S "WATER SYSTEM STANDARDS", DATED 2002, AND ALL SUBSEQUENT AMENDMENTS AND ADDITIONS, UNLESS OTHERWISE SPECIFIED.
2. CONTRACTOR SHALL VERIFY ALL CONDITIONS AT PROJECT SITE INCLUDING EXISTING STRUCTURES AND SITE CONDITIONS BEFORE COMMENCING WORK AND NOTIFY THE ENGINEER OF ANY CONFLICTS IN THE DRAWINGS AND SPECIFICATIONS.
3. CONTRACTOR SHALL VERIFY AND CHECK ALL DIMENSIONS AND DETAILS SHOWN ON THE DRAWINGS PRIOR TO START OF CONSTRUCTION. THE CONTRACTORS SHALL IMMEDIATELY NOTIFY THE ENGINEER OF ANY DISCREPANCY OR CONFLICT FOUND IN THE FIELD PRIOR TO OR DURING THE COURSE OF CONSTRUCTION AND SHALL NOT PROCEED WITH CONSTRUCTION UNTIL THE DISCREPANCY OR CONFLICT IS RESOLVED. DIMENSIONS SHOWN ARE TYPICALLY TO THE WALL FINISH, UNLESS INDICATED OTHERWISE.
4. COORDINATE ALL OPERATIONS WITH THE DHHL WEST HAWAII SUPERVISOR FOR MATERIAL STORAGE, DELIVERY ACCESS TO AND FROM WORK SITE, SPECIAL NOISY OPERATIONS, TIMING OF WORK, SEQUENCE OF OPERATIONS, INTERRUPTION OF MECHANICAL AND ELECTRICAL UTILITIES, ETC. REFER TO THE SPECIFICATIONS FOR ANY WORK PHASING REQUIREMENTS.
5. EXISTING AREAS DAMAGED AS A RESULT OF WORK DONE UNDER THIS CONTRACT SHALL BE REPAIRED AND FINISHED TO MATCH THE ADJACENT FINISHES.
6. COORDINATE CONTRACTOR MOBILIZATION SCHEDULE, STORAGE, EQUIPMENT, AND ACCESS TO THE SITE WITH THE DHHL WEST HAWAII SUPERVISOR.
7. VERIFY LOCATIONS OF ALL UTILITY LINES, CONDUITS, SURFACE OR SUB-SURFACE STRUCTURES, ETC. OF ANY NATURE THAT MAY BE AFFECTED BY THE WORK BEFORE STARTING WORK.
8. CONTRACTOR SHALL, AT ALL TIME, DURING THE COURSE OF WORK, KEEP THE CONSTRUCTION AREA, THE OWNER'S PREMISES, INCLUDING STREETS, ACCESS ROAD, AND OTHER AREAS USED BY THE CONTRACTOR CLEAN AND FREE FROM ACCUMULATION OF WASTE MATERIALS AND RUBBISH.
9. CONTRACTOR SHALL PROTECT NEW AND EXISTING WORK, EQUIPMENT, MATERIALS AND FINISHES. DAMAGED ITEMS SHALL BE REPAIRED OR REPLACED AT THE EXPENSE OF THE CONTRACTOR.
10. AT THE COMPLETION OF THE WORK, ALL SURPLUS MATERIALS AND DEBRIS SHALL BE REMOVED FROM THE RESERVOIR PREMISES AND THOROUGHLY CLEANED UP TO THE SATISFACTION OF THE ENGINEER AND DHHL WEST HAWAII SUPERVISOR.
11. PAYMENT FOR ITEMS OF WORK SPECIFIED IN THE DRAWINGS, SPECIAL PROVISIONS AND SPECIFICATIONS FOR WHICH PAYMENT IS NOT SPECIFIED SHALL NOT BE MADE DIRECTLY, BUT SHALL BE CONSIDERED INCIDENTAL TO THE VARIOUS ITEMS IN THE PROPOSAL AND NO ADDITIONAL PAYMENT SHALL BE MADE.

GRADING NOTES

1. ALL GRADING WORK SHALL CONFORM TO CHAPTER 10 OF THE HAWAII COUNTY CODE. SHOULD A GRADING PERMIT BE REQUIRED, NO WORK SHALL COMMENCE UNTIL THE DEPARTMENT OF PUBLIC WORKS (DPW) APPROVES A GRADING PERMIT.
2. THE CONTRACTOR SHALL REMOVE ALL SILT AND DEBRIS DEPOSITED IN DRAINAGE FACILITIES, ROADWAYS AND OTHER AREAS RESULTING FROM HIS WORK. THE COSTS INCURRED FOR ANY NECESSARY REMEDIAL ACTION BY THE DPW SHALL BE PAYABLE BY THE CONTRACTOR.
3. THE CONTRACTOR, AT HIS OWN EXPENSE, SHALL KEEP THE PROJECT AND SURROUNDING AREAS FREE FROM DUST NUISANCES. THE WORK SHALL BE IN CONFORMANCE WITH THE AIR POLLUTION CONTROL RULES OF THE STATE DEPARTMENT OF HEALTH, HAR 11-60.1, FUGITIVE DUST.
4. ALL GRADING OPERATIONS SHALL BE PERFORMED IN CONFORMANCE WITH THE APPLICABLE PROVISIONS OF THE HAWAII ADMINISTRATIVE RULES, TITLE 11, CHAPTER 55, WATER POLLUTION CONTROL AND CHAPTER 54, WATER QUALITY STANDARDS, AND TO THE EROSION AND SEDIMENTATION CONTROL STANDARDS AND GUIDELINES OF THE DEPARTMENT OF PUBLIC WORKS, COUNTY OF HAWAII.
5. THE CONTRACTOR SHALL SOD OR PLANT ALL SLOPES AND EXPOSED AREAS IMMEDIATELY AFTER THE GRADING WORK HAS BEEN COMPLETED.
6. FILLS ON SLOPES STEEPER THAN 5:1 SHALL BE KEYED.
7. THE CONTRACTOR SHALL INFORM THE DPW OF THE LOCATION OF THE DISPOSAL AND/OR BORROW SITE(S) REQUIRED FOR THIS PROJECT WHEN AN APPLICATION FOR A GRADING PERMIT IS MADE. THE DISPOSAL AND/OR BORROW SITE(S) MUST ALSO FULFILL THE REQUIREMENTS OF THE GRADING ORDINANCE.
8. NO GRADING WORK SHALL BE DONE ON SATURDAYS, SUNDAYS AND HOLIDAYS ANYTIME WITHOUT PRIOR APPROVAL FROM THE DEPARTMENT OF PUBLIC WORKS. GRADING WORK ON NORMAL WORKING DAYS SHALL BE BETWEEN THE HOURS OF 7:00 A.M. TO 3:30 P.M.
9. FILLS SHALL BE COMPACTED TO 90 PERCENT (90%) OF MAXIMUM DENSITY PER ASTM D-1557 TEST.
10. THE CONTRACTOR SHALL REMOVE ALL VEGETATION BEFORE PLACING FILLS ON NATURAL GROUND SURFACE.

ABBREVIATIONS

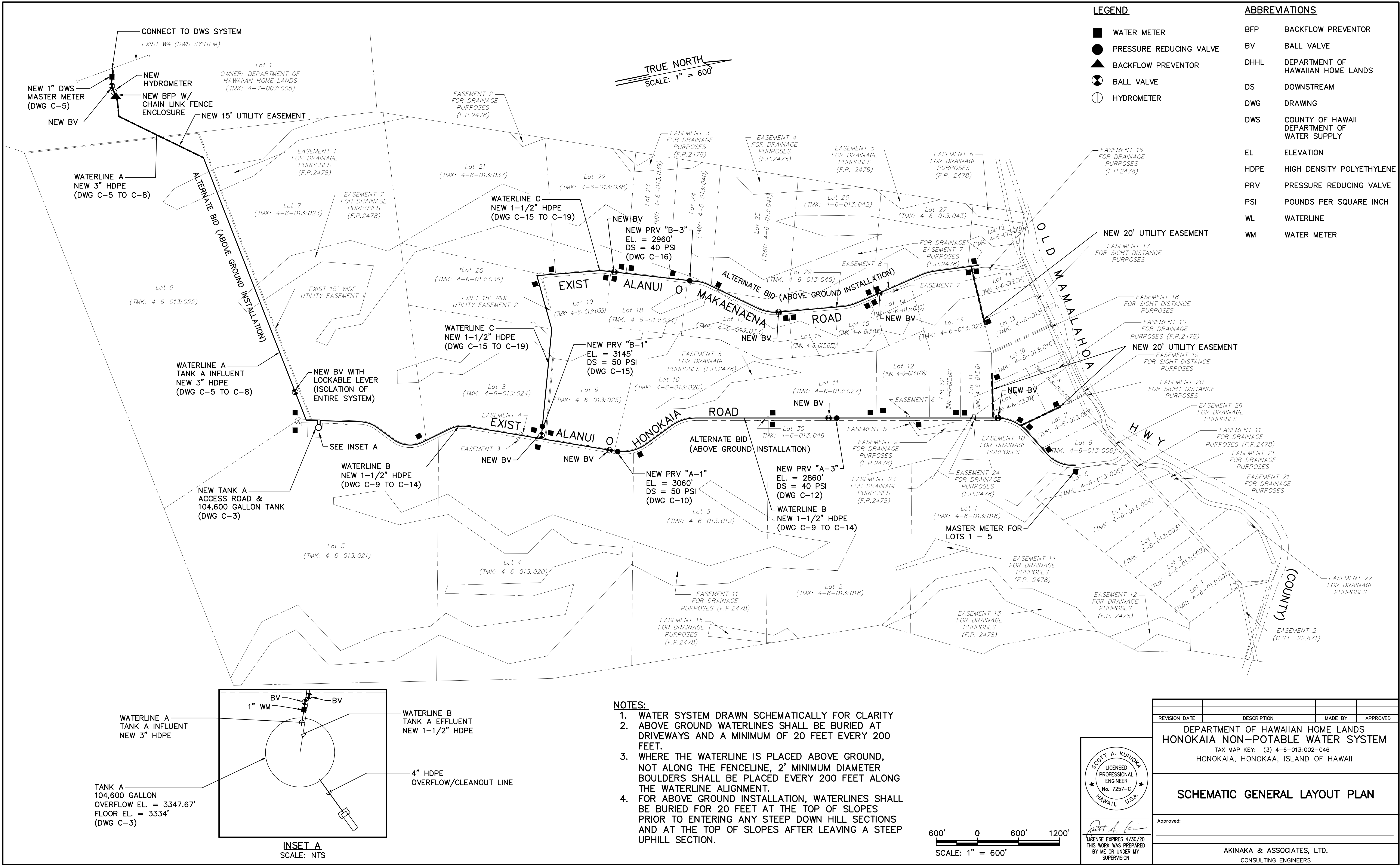
AC	ASPHALT CONCRETE	LB	POUND
ARV	AUTOMATIC AIR RELEASE VALVE	MAX	MAXIMUM
℄	BASELINE	MB	METER BOX
BFP	BACKFLOW PREVENTOR	MIN	MINIMUM
BV	BALL VALVE	OC	ON CENTER
BVC	BEGIN VERTICAL CURVE	OD	OUTSIDE DIAMETER
BW	BOTTOM OF WALL	℄	PROPERTY LINE
℄	CENTERLINE	PC	POINT OF CURVATURE
CONC	CONCRETE	PROF	PROFILE
CONN	CONNECTION	PRV	PRESSURE REDUCING VALVE
ø	DIAMETER	PSI	POUNDS PER SQUARE INCH
DET	DETAIL	PT	POINT OF TANGENCY
DHHL	DEPARTMENT OF HAWAIIAN HOME LANDS	PVI	POINT OF VERTICAL INTERSECTION
DIA	DIAMETER	R/W	RIGHT-OF-WAY
DS	DOWNSTREAM	RD	ROAD
DWS	COUNTY OF HAWAII DEPARTMENT OF WATER SUPPLY	RES	RESERVOIR
EG	EXIST GRADE	SHLDR	SHOULDER
EL	ELEVATION	SHT	SHEET
EVC	END VERTICAL CURVE	SS	STRUCTURAL STEEL
EXIST	EXISTING	STA	STATION
FG	FINISHED GRADE	TMK	TAX MAP KEY
FP	FILE PLAN	TW	TOP OF WALL
FTG	FOOTING	TYP	TYPICAL
GALV	GALVANIZED	UPC	UNIFORM PLUMBING CODE
GR	GRADE	VB	VALVE BOX
GRP	GROUTED RUBBLE PAVING	VC	VERTICAL CURVE
HDD	HORIZONTAL DIRECTIONAL DRILLING	WL	WATERLINE
HDPE	HIGH DENSITY POLYETHYLENE	WM	WATER METER
HP	HIGH POINT	WMH	WATER MANHOLE
		WSS	WATER SYSTEM STANDARDS



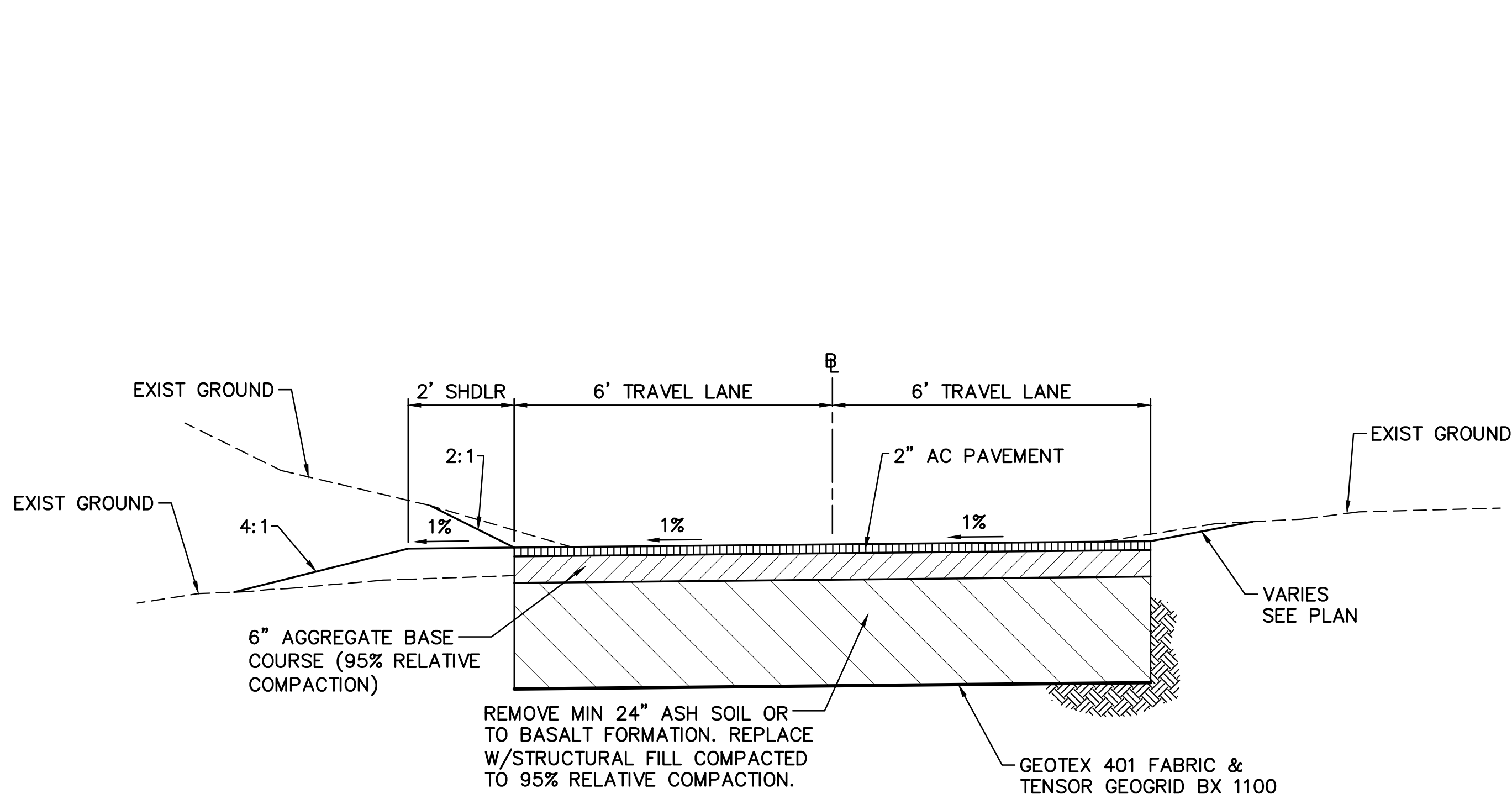
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CONSTRUCTION NOTES			
Approved:			
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			

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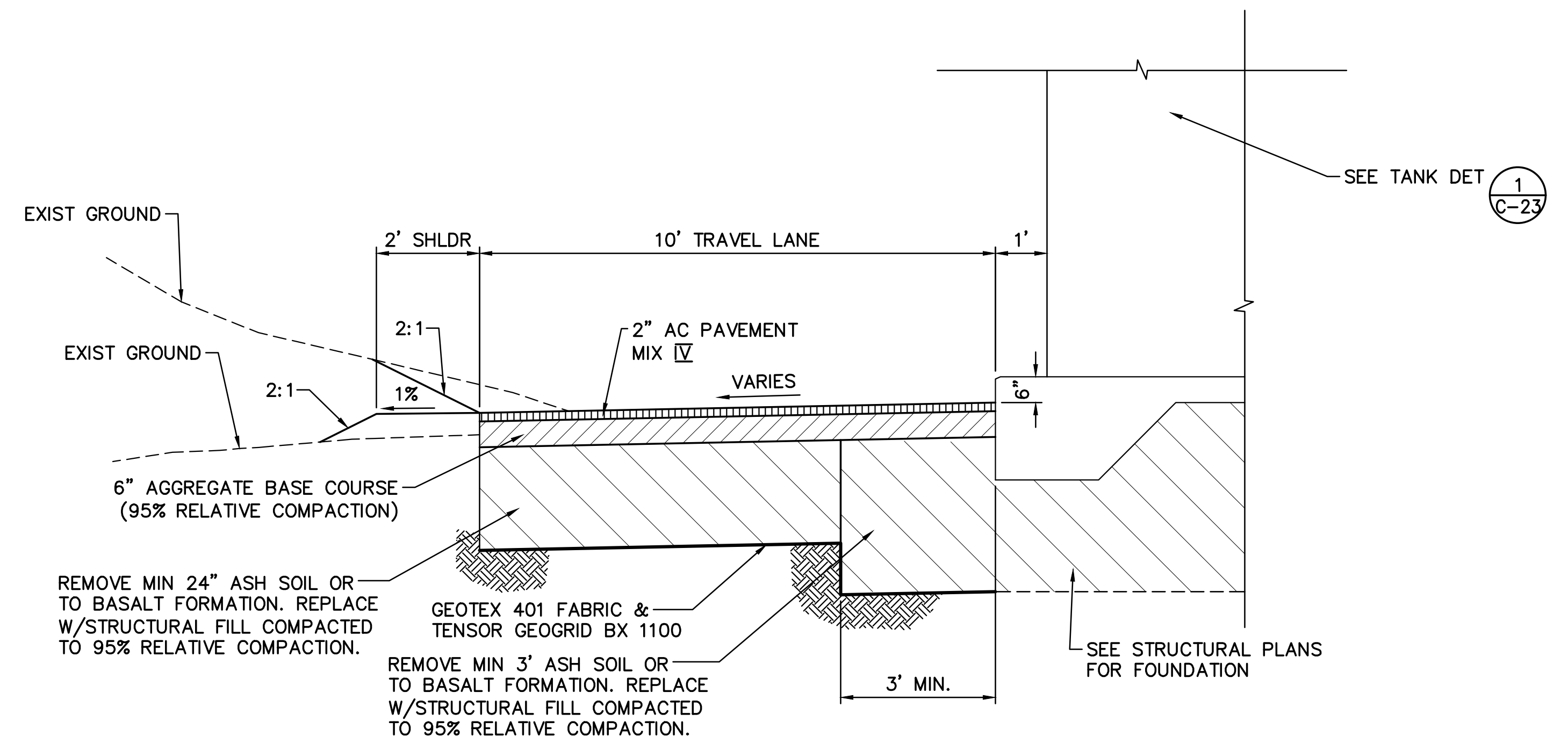
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1
C-4

TYPICAL ROADWAY SECTION — TANK A ACCESS ROAD

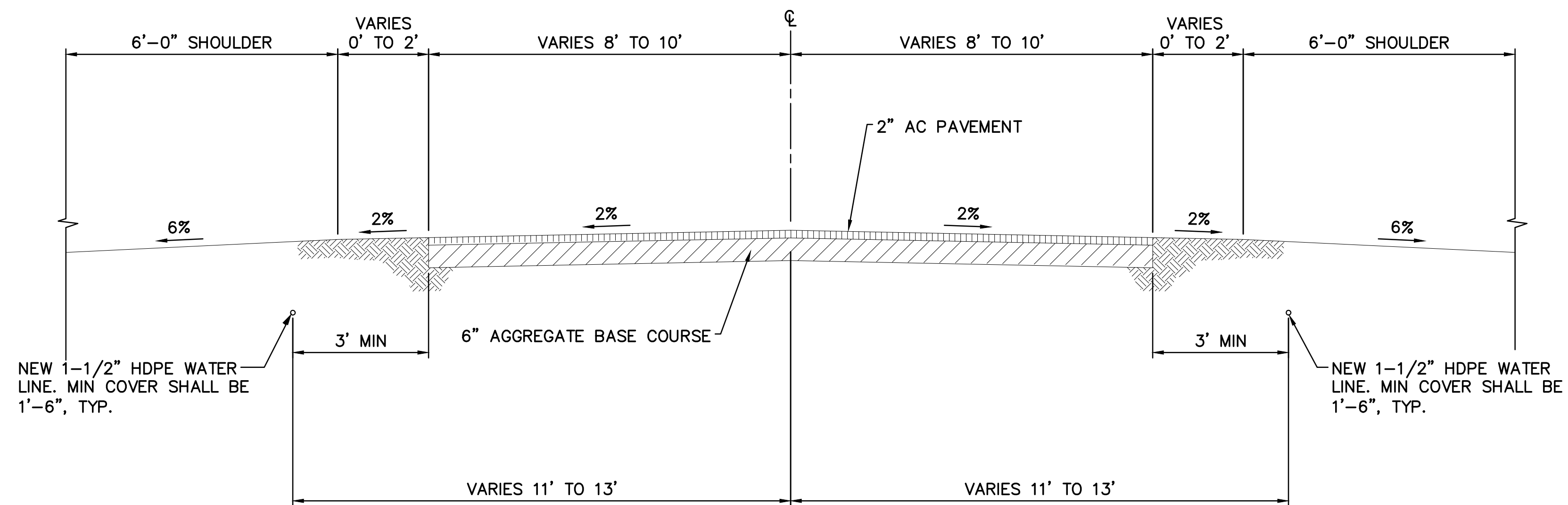
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2
C-4

TYPICAL ROADWAY SECTION TANK A PERIMETER ROAD

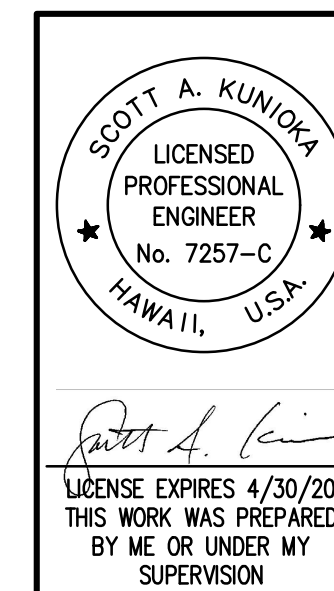
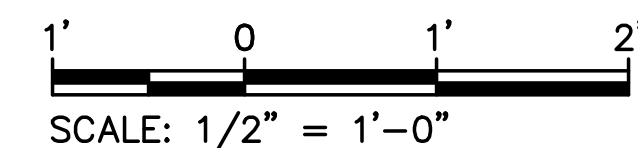
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3
C-4

EXIST ALANUI O MAKAEANAENA & ALANUI O HONOKAIA TYPICAL ROADWAY SECTION

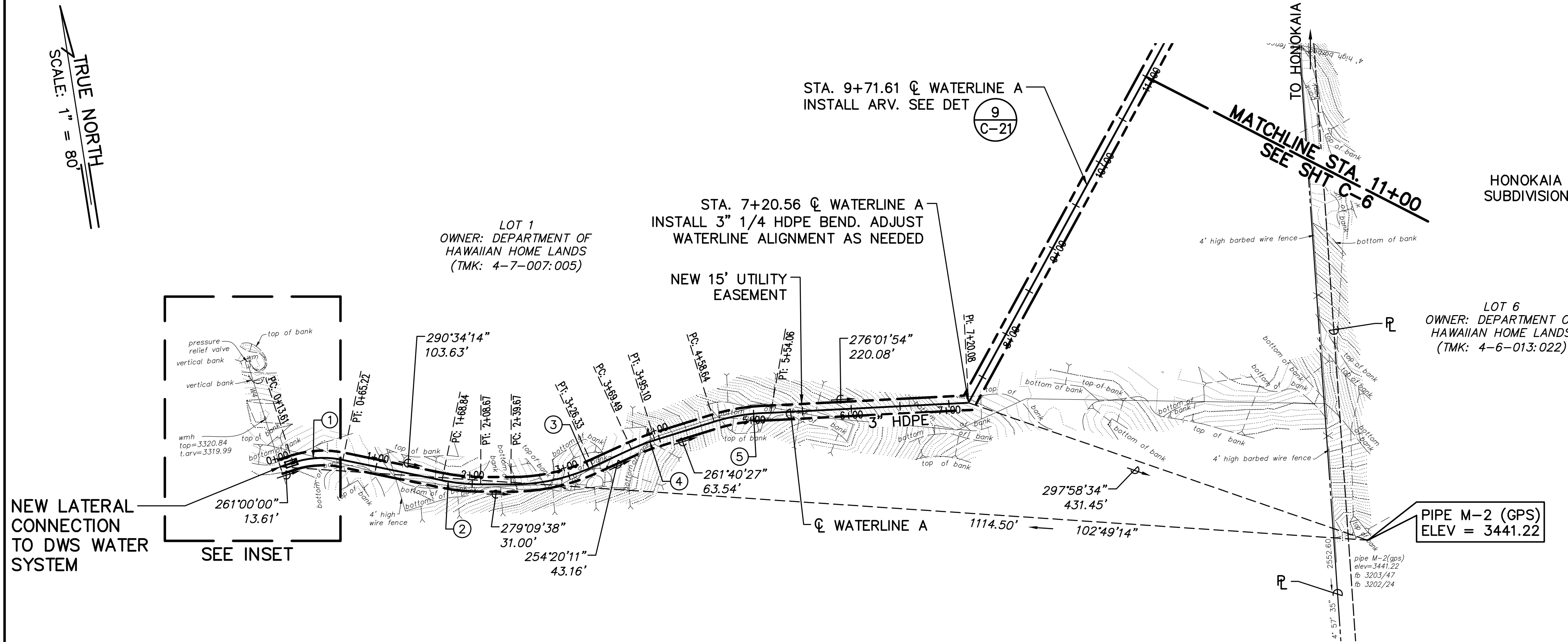
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TYPICAL SECTIONS			
Approved: _____			
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			
FILE	POCKET	FOLDER	NO.

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Last Saved: 10/16/2018
Plotted on: 10/16/2018
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& Profile I.dwg

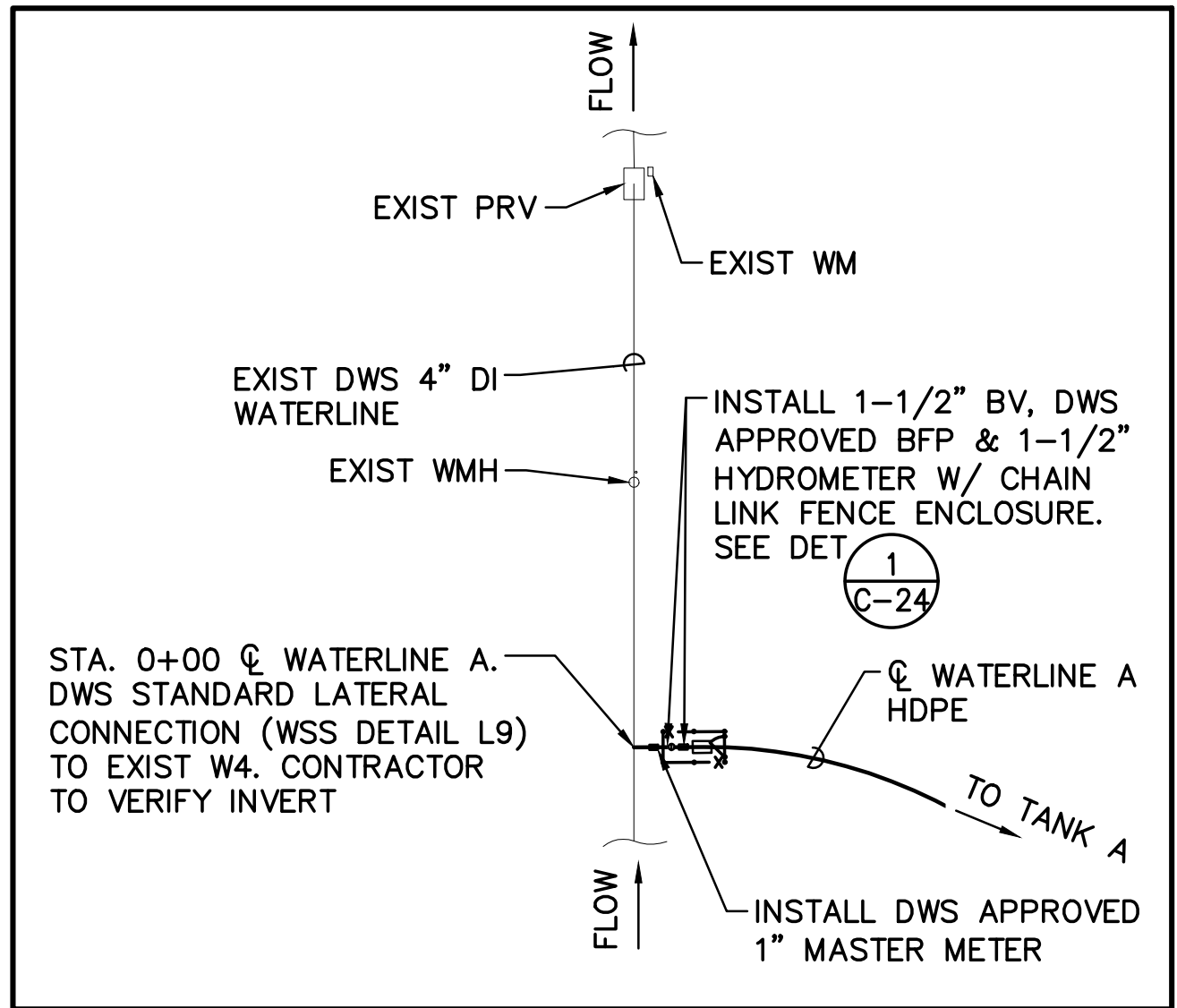
TRUE NORTH
SCALE: 1" = 80'



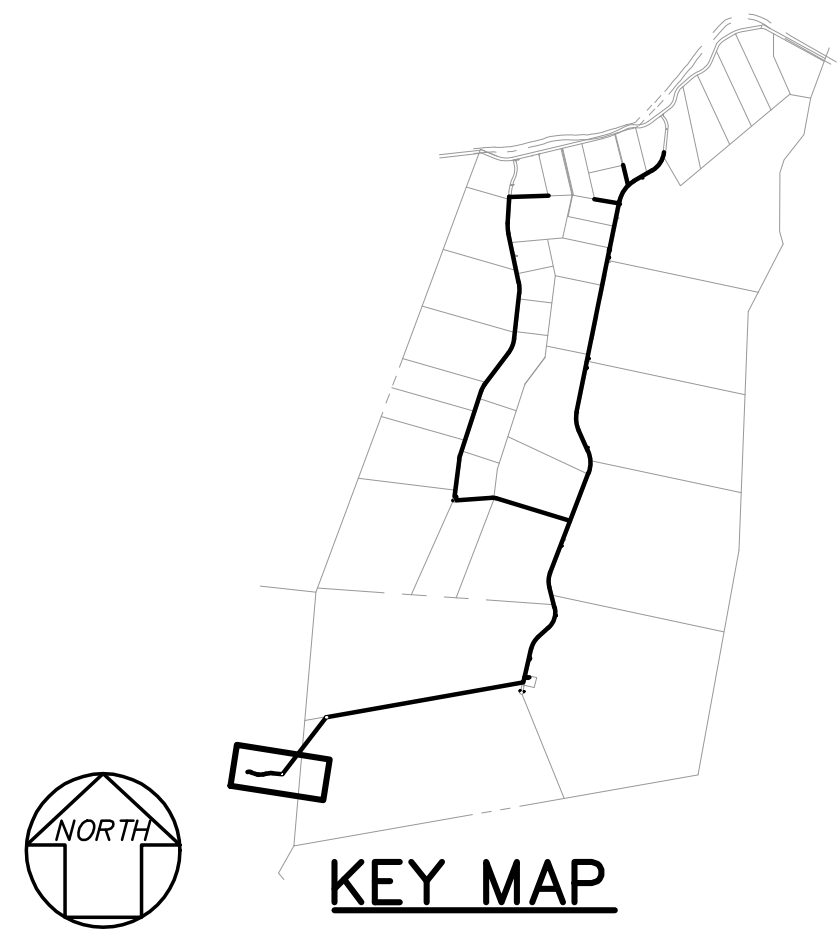
PLAN - WATERLINE A
SCALE: 1" = 80'

LEGEND

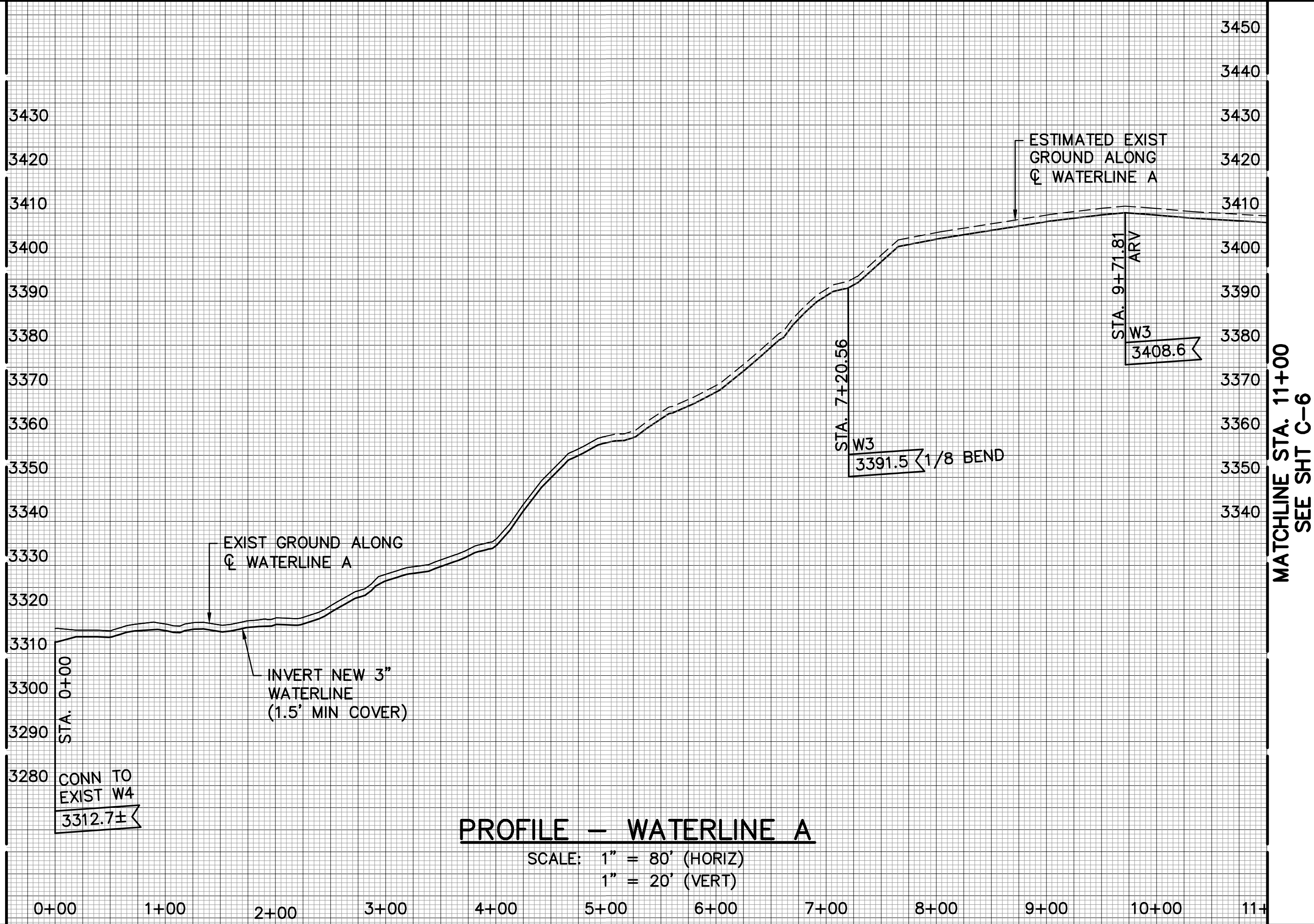
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- [D] DOUBLE SERVICE LATERAL CONNECTION, SEE DETAIL 1 C-21



INSET
NOT TO SCALE



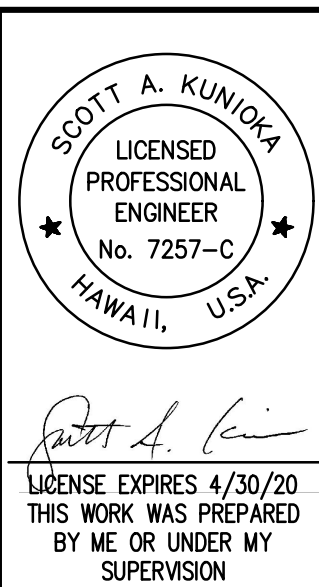
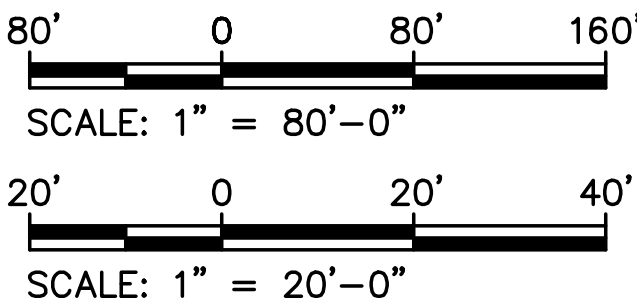
CURVE DATA						
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2	11°24'36"	5°42'18"	200.00	19.98	39.76	39.83
3	24°49'27"	12°24'43"	200.00	44.02	85.98	86.65
4	7°20'16"	3°40'08"	200.00	12.82	25.60	25.61
5	16°52'11"	8°26'06"	200.00	29.66	58.67	58.89



PROFILE - WATERLINE A
SCALE: 1" = 80' (HORIZ)
1" = 20' (VERT)

NOTES:

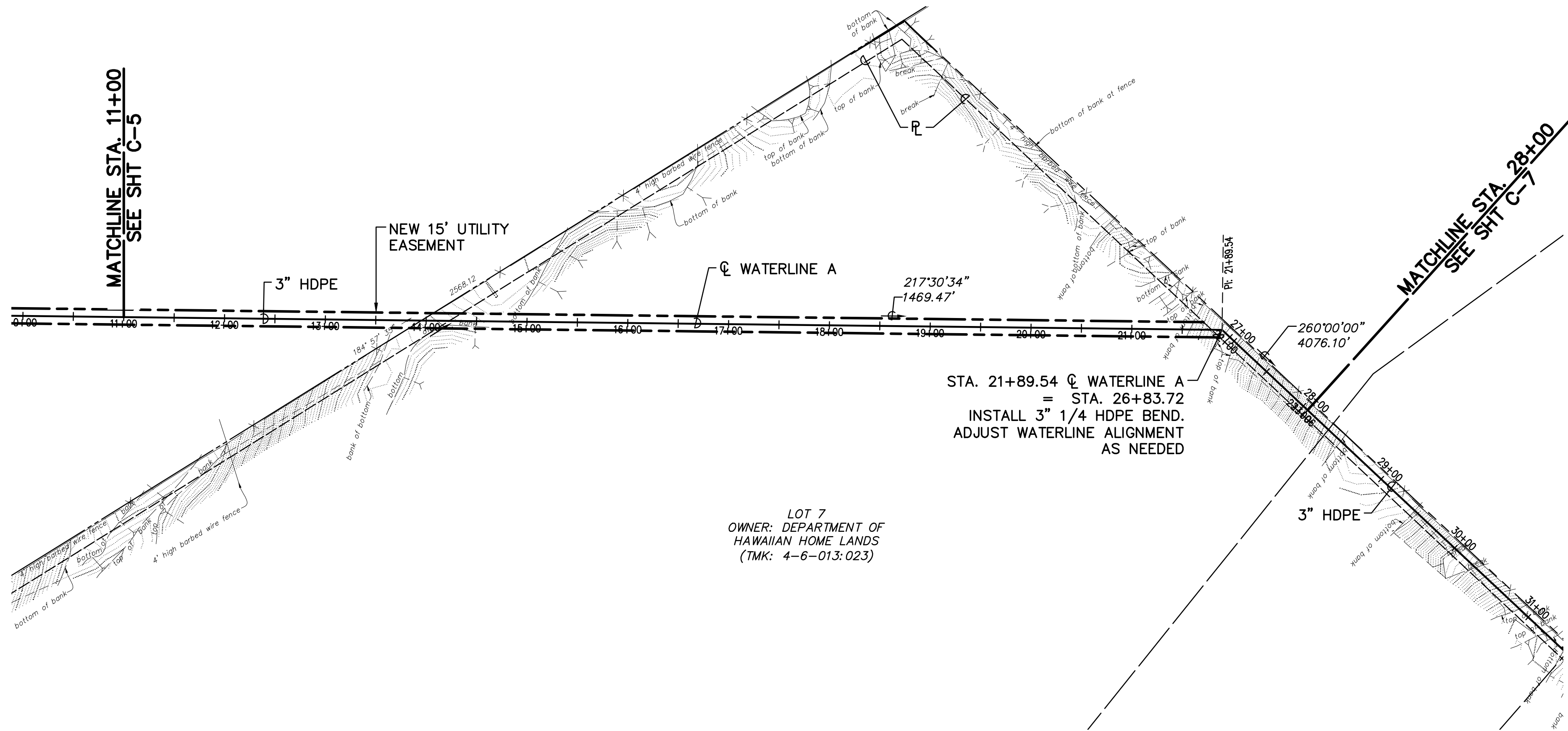
1. THE CONTRACTOR SHALL IMMEDIATELY CLOSE ALL GATES THAT THEY OPEN FOR ACCESS. HOWEVER, ANY GATES THAT ARE OPEN SHALL REMAIN OPEN.
2. THE CM AND CONTRACTOR SHALL MEET WITH MR. GLENN BERTELMANN TO IDENTIFY THE LOCATION OF THE TWO EXISTING ABOVE GROUND WATERLINES IN HIS LOT AT LEAST 1 WEEK PRIOR TO THE START OF CONSTRUCTION.
3. THE CONTRACTOR SHALL LAY OUT THE WATERLINE WITH THE PROPOSED ALIGNMENT PRIOR TO CONSTRUCTION. THE CONTRACTOR MAY ELECT TO MODIFY THE ALIGNMENT OF THE WATERLINE WITH THE WRITTEN APPROVAL OF DHHL AND THE LESSEE OVER WHOSE LAND THE CHANGES ARE MADE. ADDITIONAL MATERIAL AND COSTS FOR THESE CHANGES SHALL BE BORNE BY THE CONTRACTOR AND WILL BE CONSIDERED INCIDENTAL TO THE PROJECT.



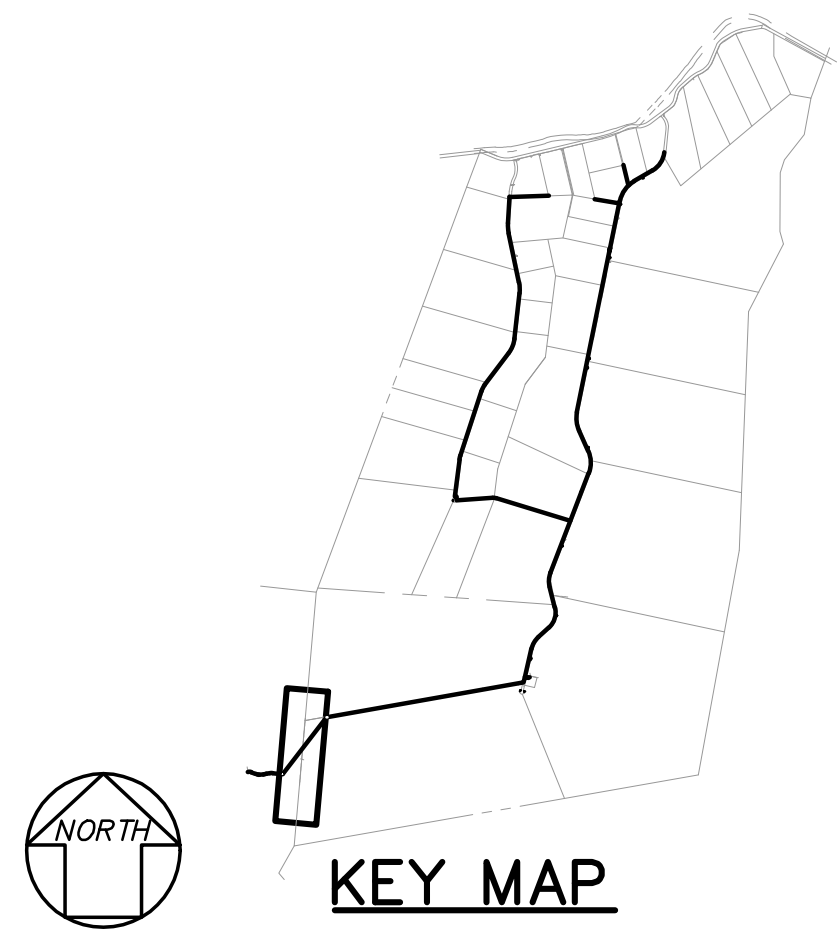
REVISION DATE	DESCRIPTION	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS HONOKAIA NON-POTABLE WATER SYSTEM TAX MAP KEY: (3) 4-6-013:002-046 HONOKAIA, HONOKAA, ISLAND OF HAWAII			
WATERLINE A PLAN & PROFILE STA. 0+00 TO STA. 11+00			
Approved: _____			
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			
FILE	POCKET	FOLDER	NO.

G:\dhl1401 honokaia non-pot\300
Last Save by: LRS
Last Saved: 10/16/2018
Plotted on: 10/16/2018
DSCN\310 plans_Alt Install\DHHL1401-Plan
& Profile 2.dwg

TRUE NORTH
SCALE: 1" = 80'



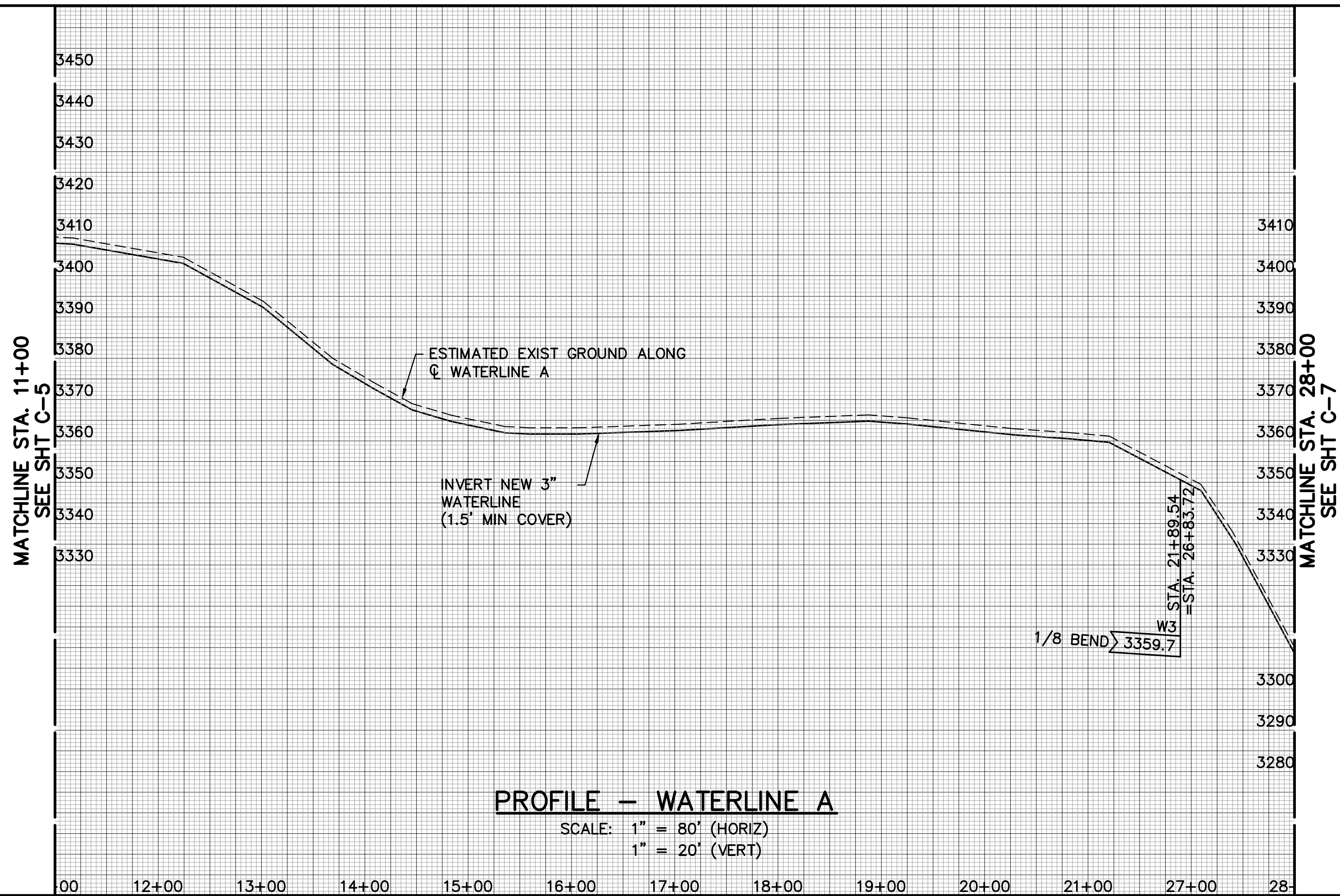
PLAN — WATERLINE A
SCALE: 1" = 80'



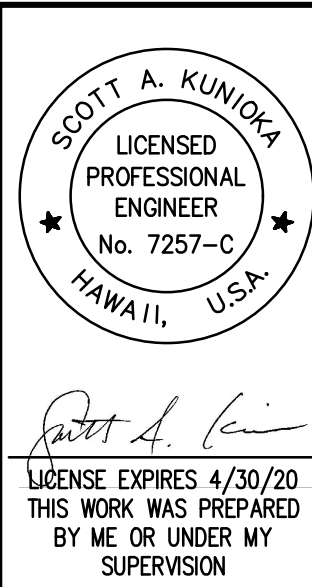
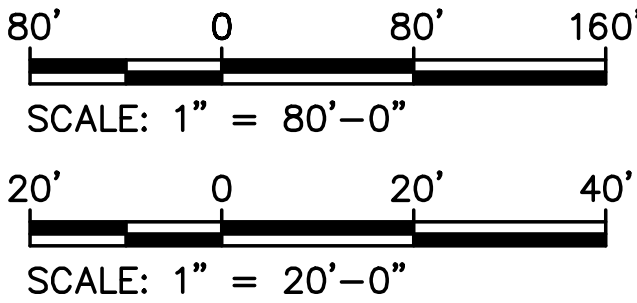
NOTE: THE CONTRACTOR SHALL LAY OUT THE WATERLINE WITH THE PROPOSED ALIGNMENT PRIOR TO CONSTRUCTION. THE CONTRACTOR MAY ELECT TO MODIFY THE ALIGNMENT OF THE WATERLINE WITH THE WRITTEN APPROVAL OF DHHL AND THE LESSEE OVER WHOSE LAND THE CHANGES ARE MADE. ADDITIONAL MATERIAL AND COSTS FOR THESE CHANGES SHALL BE BORNE BY THE CONTRACTOR AND WILL BE CONSIDERED INCIDENTAL TO THE PROJECT.

LEGEND

- L** SINGLE SERVICE LATERAL CONNECTION, SEE DETAIL **1 C-21**
- D** DOUBLE SERVICE LATERAL CONNECTION, SEE DETAIL **1 C-21**

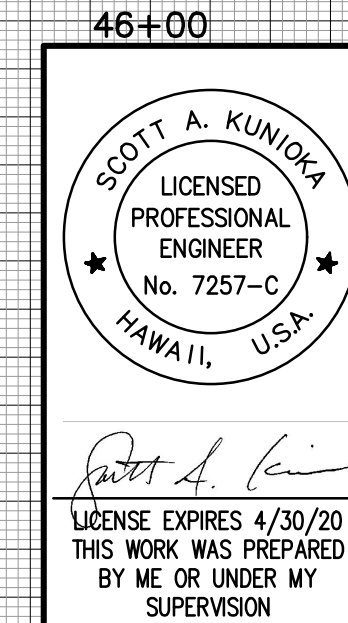
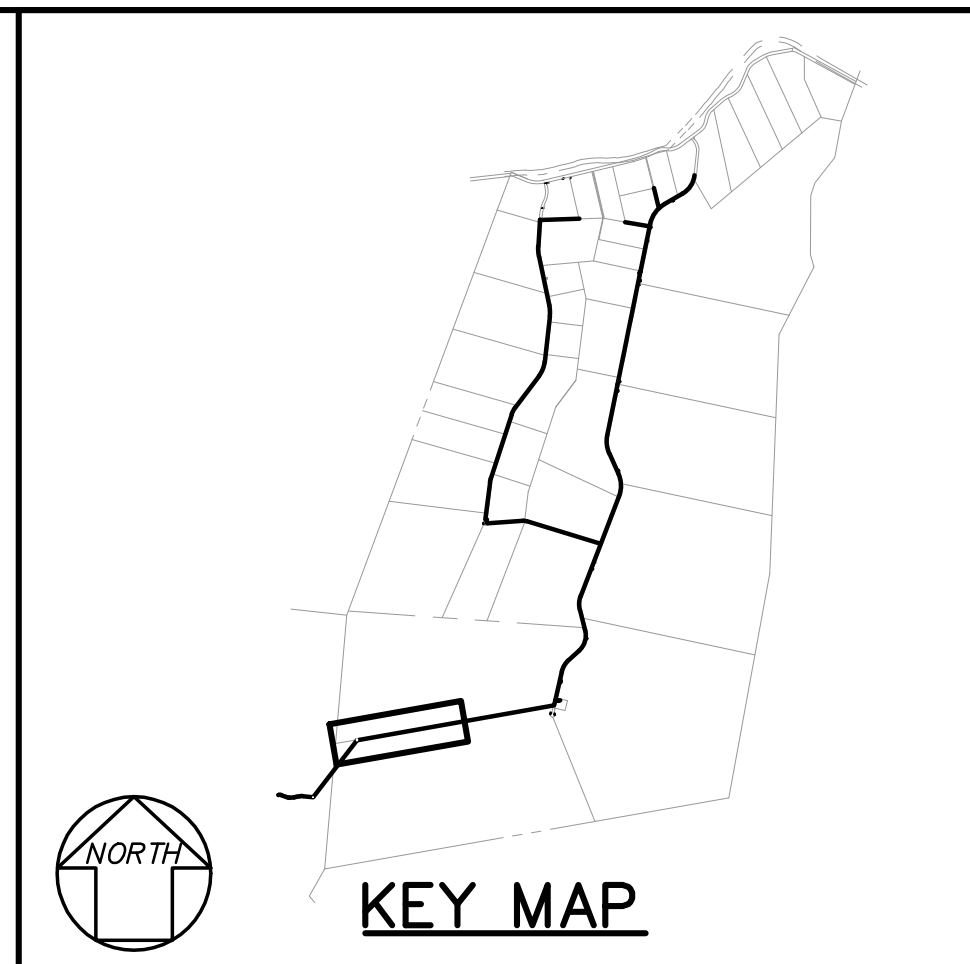
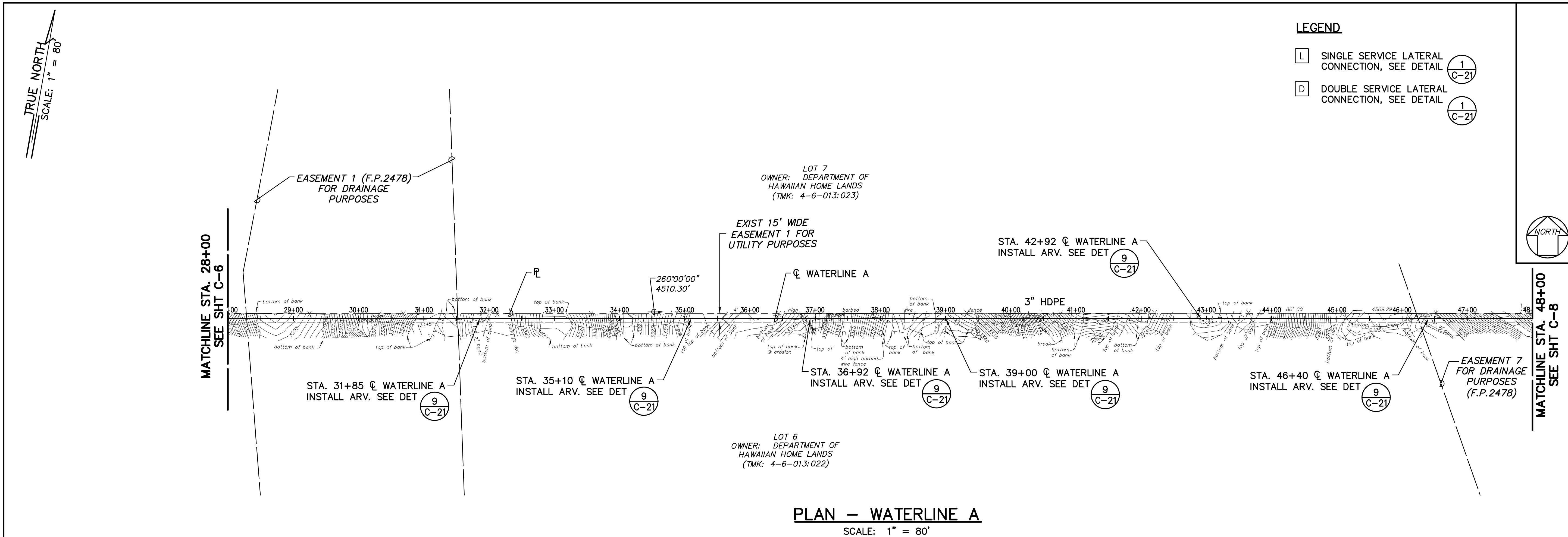


PROFILE — WATERLINE A
SCALE: 1" = 80' (HORIZ)
1" = 20' (VERT)



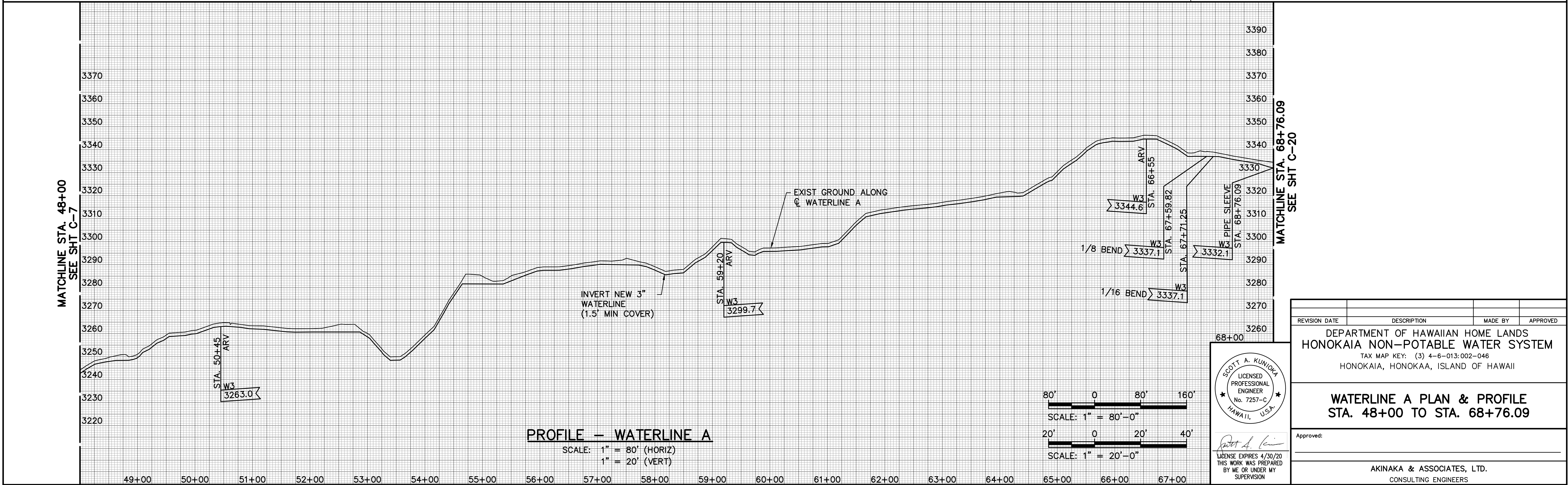
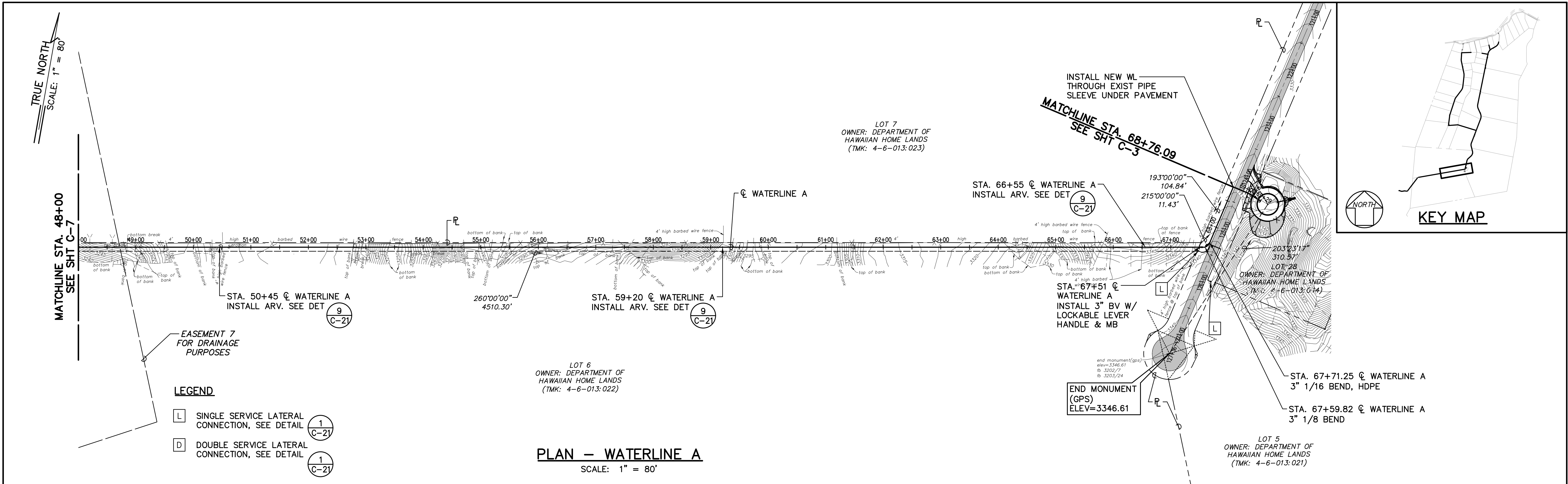
REVISION DATE	DESCRIPTION	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS HONOKAIA NON-POTABLE WATER SYSTEM TAX MAP KEY: (3) 4-6-013:002-046 HONOKAIA, HONOKAA, ISLAND OF HAWAII			
WATERLINE A PLAN & PROFILE STA. 11+00 TO STA. 28+00			
Approved: _____			
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			
FILE	POCKET	FOLDER	NO.

g:\dhl1401 honokaia non-pot\300
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& Profile 3.dwg
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Last Saved: 8/20/2018
Plotted on: 8/30/2018

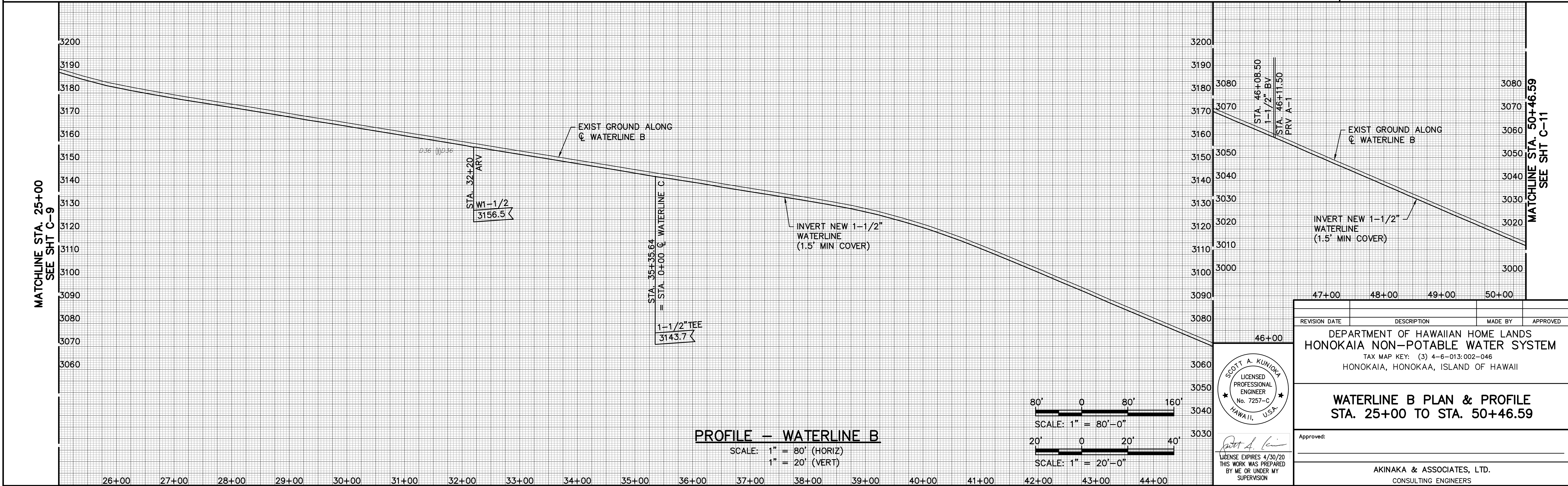
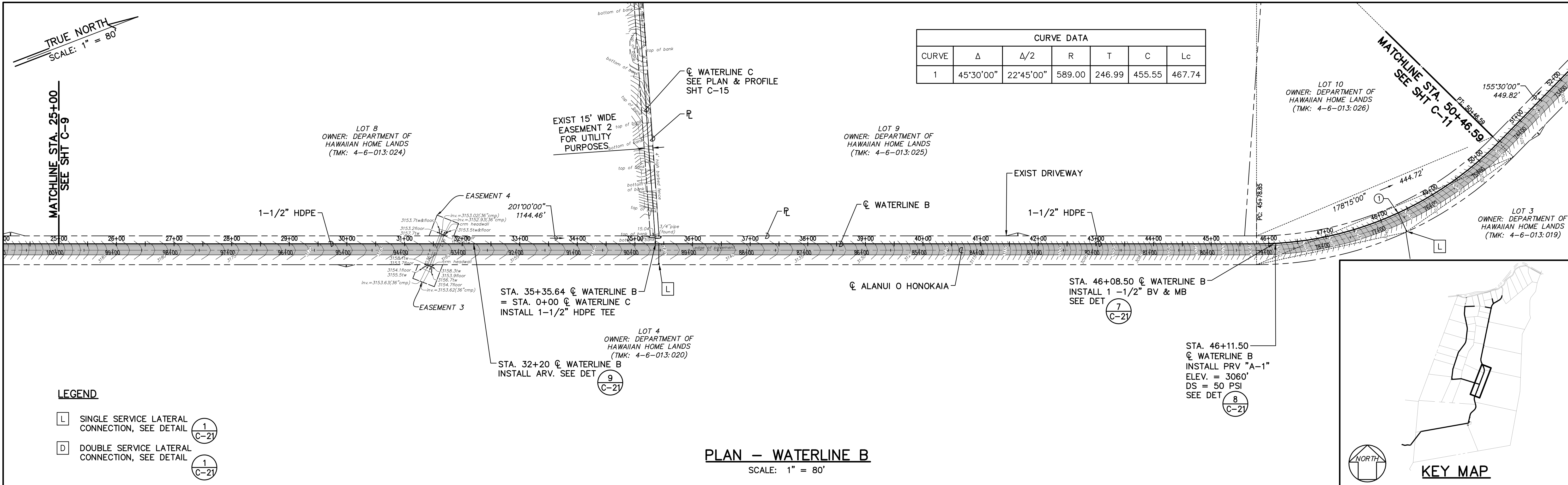


REVISION DATE	DESCRIPTION	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS HONOKAIA NON-POTABLE WATER SYSTEM TAX MAP KEY: (3) 4-6-013:002-046 HONOKAIA, HONOKAA, ISLAND OF HAWAII			
WATERLINE A PLAN & PROFILE STA. 28+00 TO STA. 48+00			
Approved: _____			
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			
FILE	POCKET	FOLDER	NO.

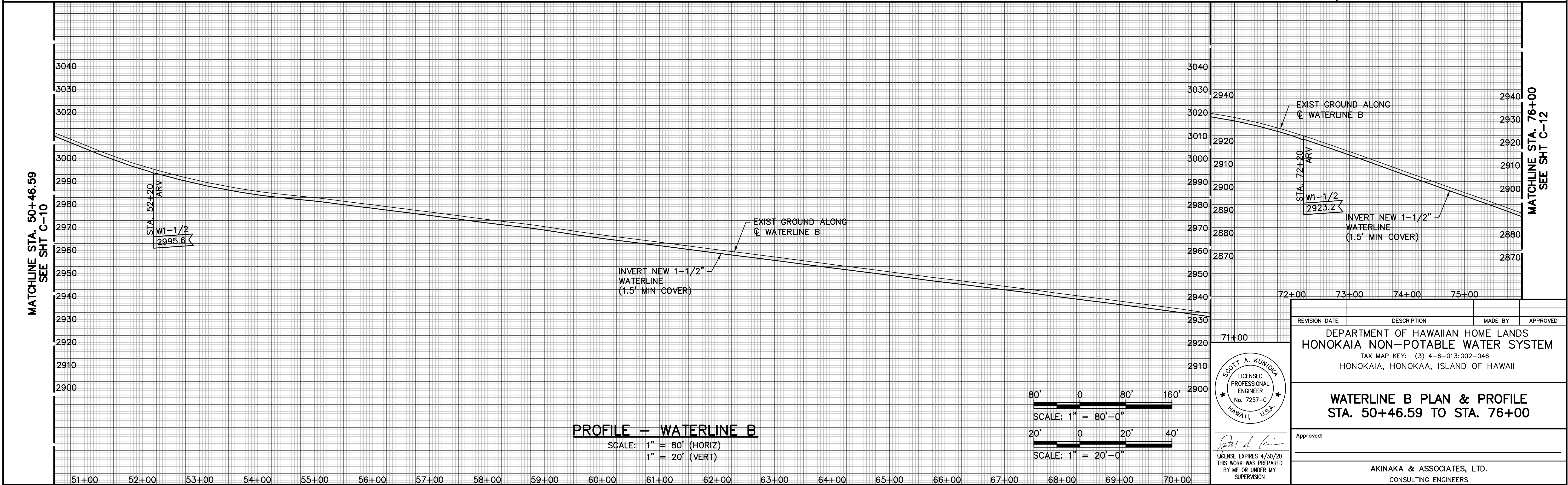
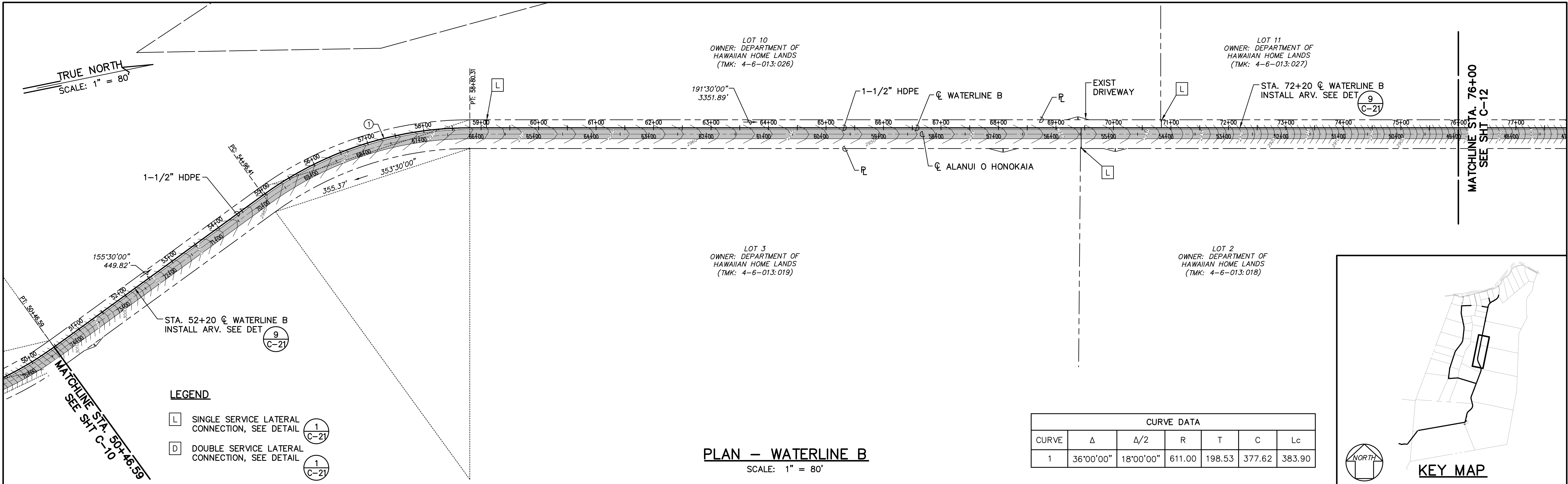
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& Profile 4.dwg
Last Save by: LRS
Last Saved: 8/20/2018
Plotted on: 8/30/2018



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& Profile 6.dwg
Last Save by: LRS
Last Saved: 8/20/2018
Plotted on: 8/30/2018



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Last Saved: 8/13/2018
Plotted on: 8/30/2018



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Last Saved: 5/29/2018
Plotted on: 8/30/2018

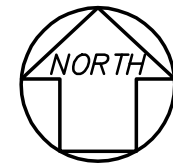
TRUE NORTH
SCALE: 1" = 80'

CURVE DATA						
CURVE	Δ	Δ/2	R	T	C	Lc
1	26°41'22"	13°20'41"	20.00	4.74	9.23	9.32
2	26°37'31"	13°18'46"	20.00	4.73	9.21	9.29
3	14°00'38"	7°00'19"	20.00	2.46	4.88	4.89
4	13°56'48"	6°58'24"	20.00	2.45	4.86	4.87

LOT 11
OWNER: DEPARTMENT OF
HAWAIIAN HOME LANDS
(TMK: 4-6-013:027)

LOT 12
OWNER: DEPARTMENT OF
HAWAIIAN HOME LANDS
(TMK: 4-6-013:028)

LOT 12
OWNER: DEPARTMENT OF
HAWAIIAN HOME LANDS
(TMK: 4-6-013:012)



KEY MAP

LOT 11
OWNER: DEPARTMENT OF
HAWAIIAN HOME LANDS
(TMK: 4-6-013:011)

LOT 1
OWNER: DEPARTMENT OF
HAWAIIAN HOME LANDS
(TMK: 4-6-013:016)

MATCHLINE STA. 76+00
SEE SHT C-11

MATCHLINE STA. 101+00
SEE SHT C-13

LEGEND

L

SINGLE SERVICE LATERAL
CONNECTION, SEE DETAIL

D

DOUBLE SERVICE LATERAL
CONNECTION, SEE DETAIL

1
C-21

1
C-21

STA. 79+43.87 ϕ WATERLINE B
INSTALL 1-1/2" BV & MB
SEE DET

STA. 79+46.87 ϕ
WATERLINE B
INSTALL PRV "A-2"
EL. = 2860'
DS. = 40 PSI
SEE DET

LOT 2
OWNER: DEPARTMENT OF
HAWAIIAN HOME LANDS
(TMK: 4-6-013:018)

PLAN - WATERLINE B

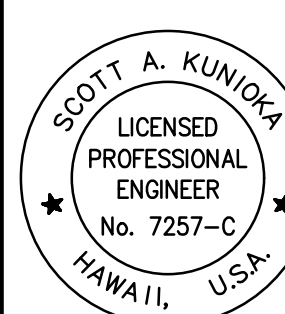
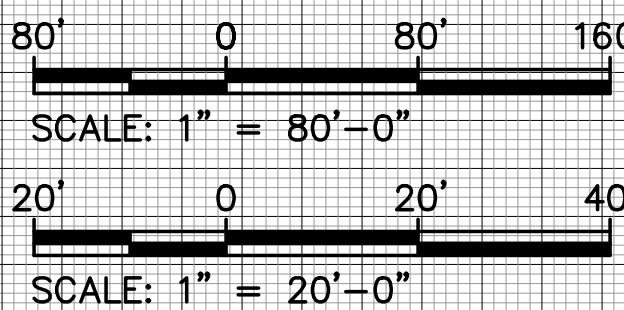
SCALE: 1" = 80'

MATCHLINE STA. 76+00
SEE SHT C-11

MATCHLINE STA. 101+00
SEE SHT C-13

PROFILE - WATERLINE B

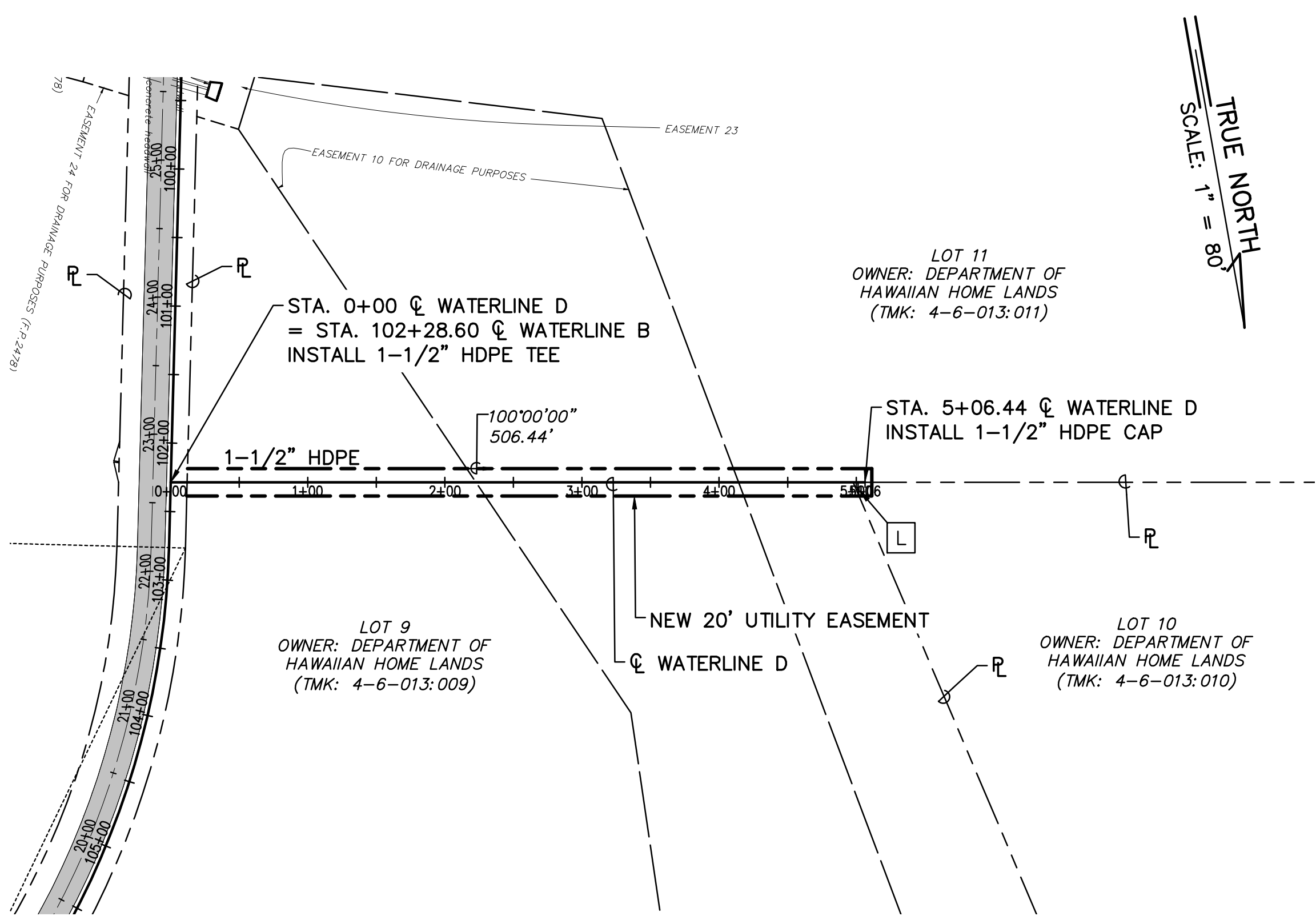
SCALE: 1" = 80' (HORIZ)
1" = 20' (VERT)



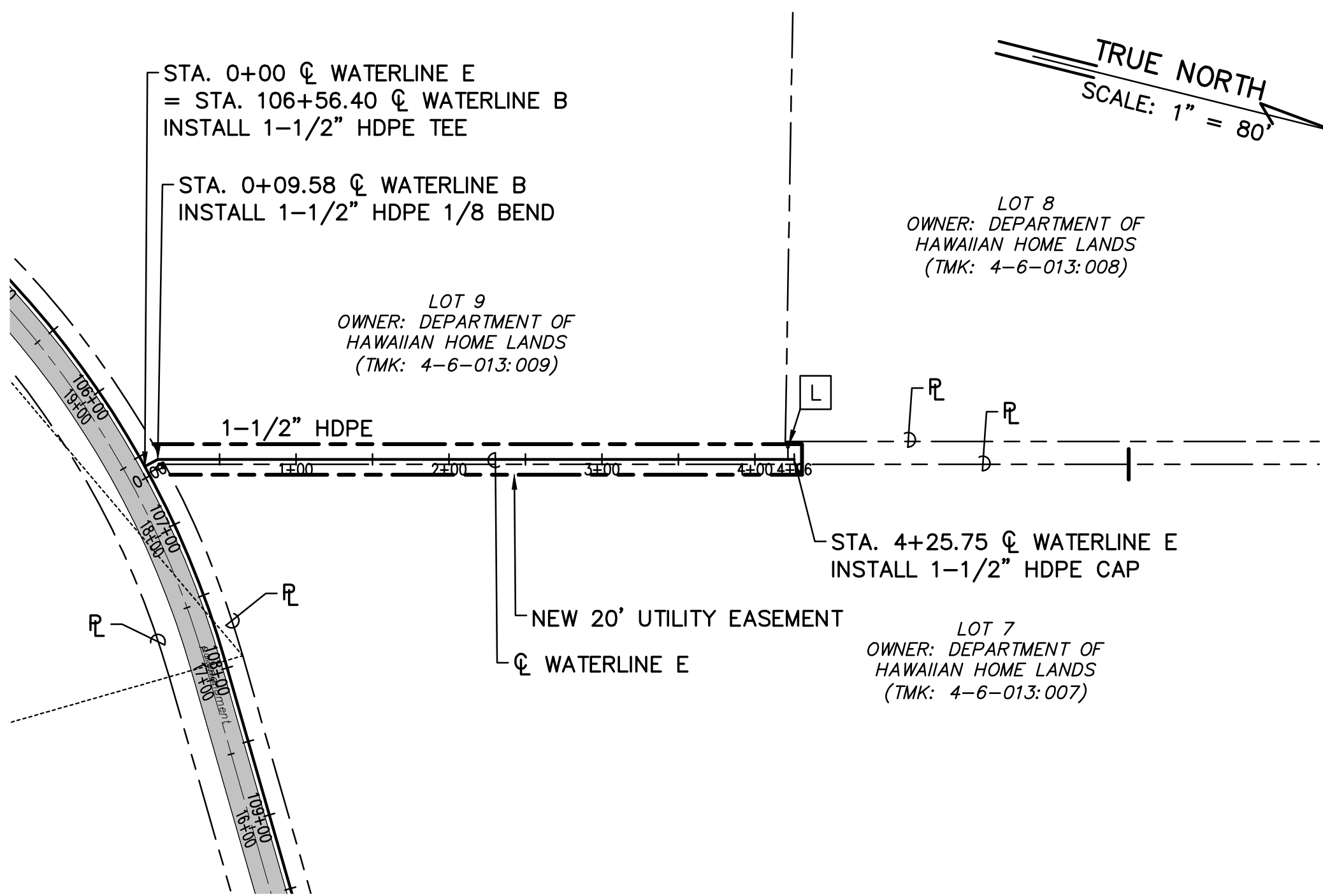
Approved: *Scott A. Kunio*
LICENSE EXPIRES 4/30/20
THIS WORK WAS PREPARED
BY ME OR UNDER MY
SUPERVISION

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS HONOKAIA NON-POTABLE WATER SYSTEM TAX MAP KEY: (3) 4-6-013:002-046 HONOKAIA, HONOKAA, ISLAND OF HAWAII			
WATERLINE B PLAN & PROFILE STA. 76+00 TO STA. 101+00			
Approved: _____			
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			
FILE	POCKET	FOLDER	NO.

g:\dhh11401 honokaia non-pot\300
DSGN\310 plans_Alt Install\DHHL1401-Plan
& Profile 24.dwg
Last Save by: LRS
Last Saved: 5/30/2018
Plotted on: 8/30/2018



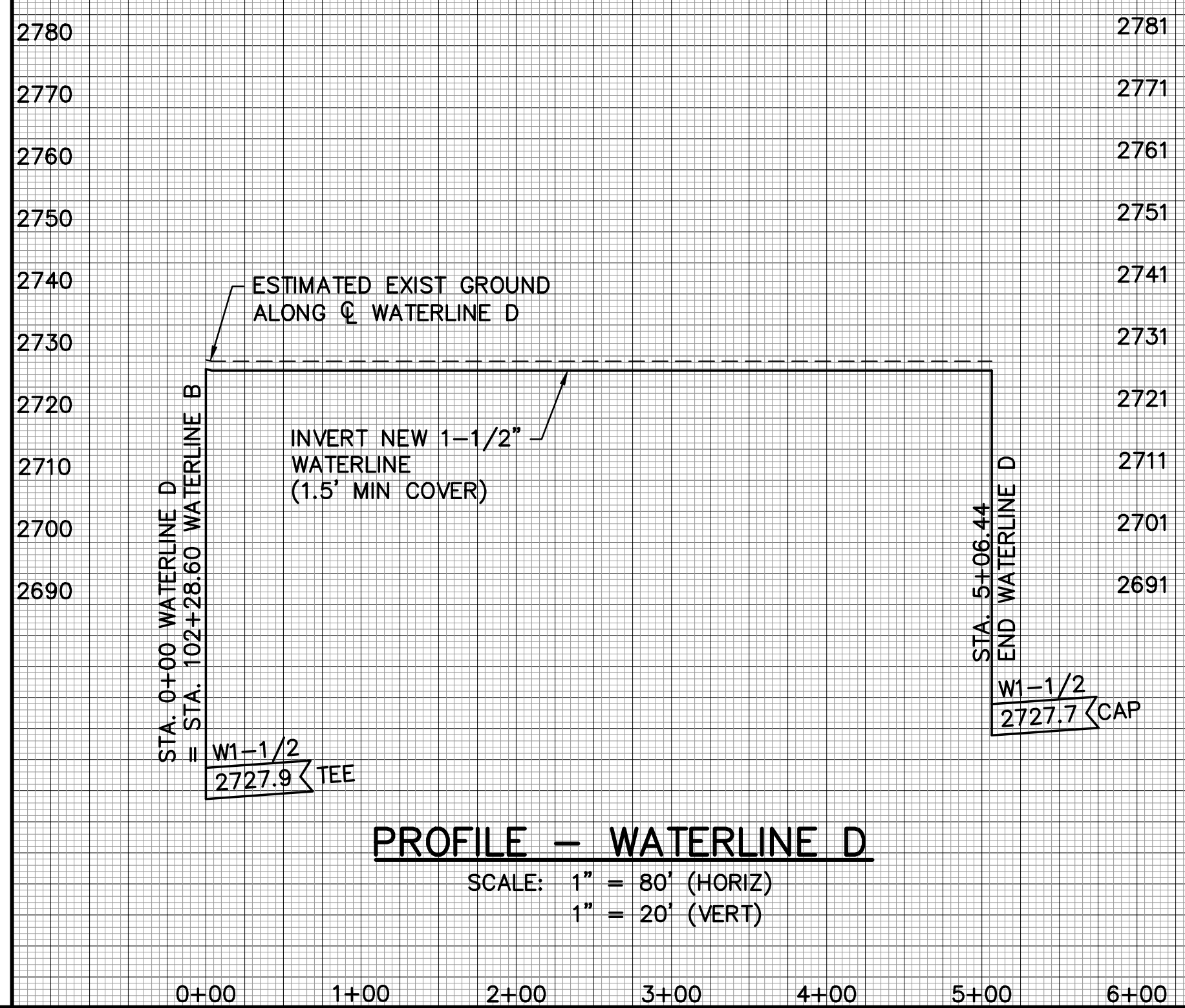
PLAN — WATERLINE D
SCALE: 1" = 80'



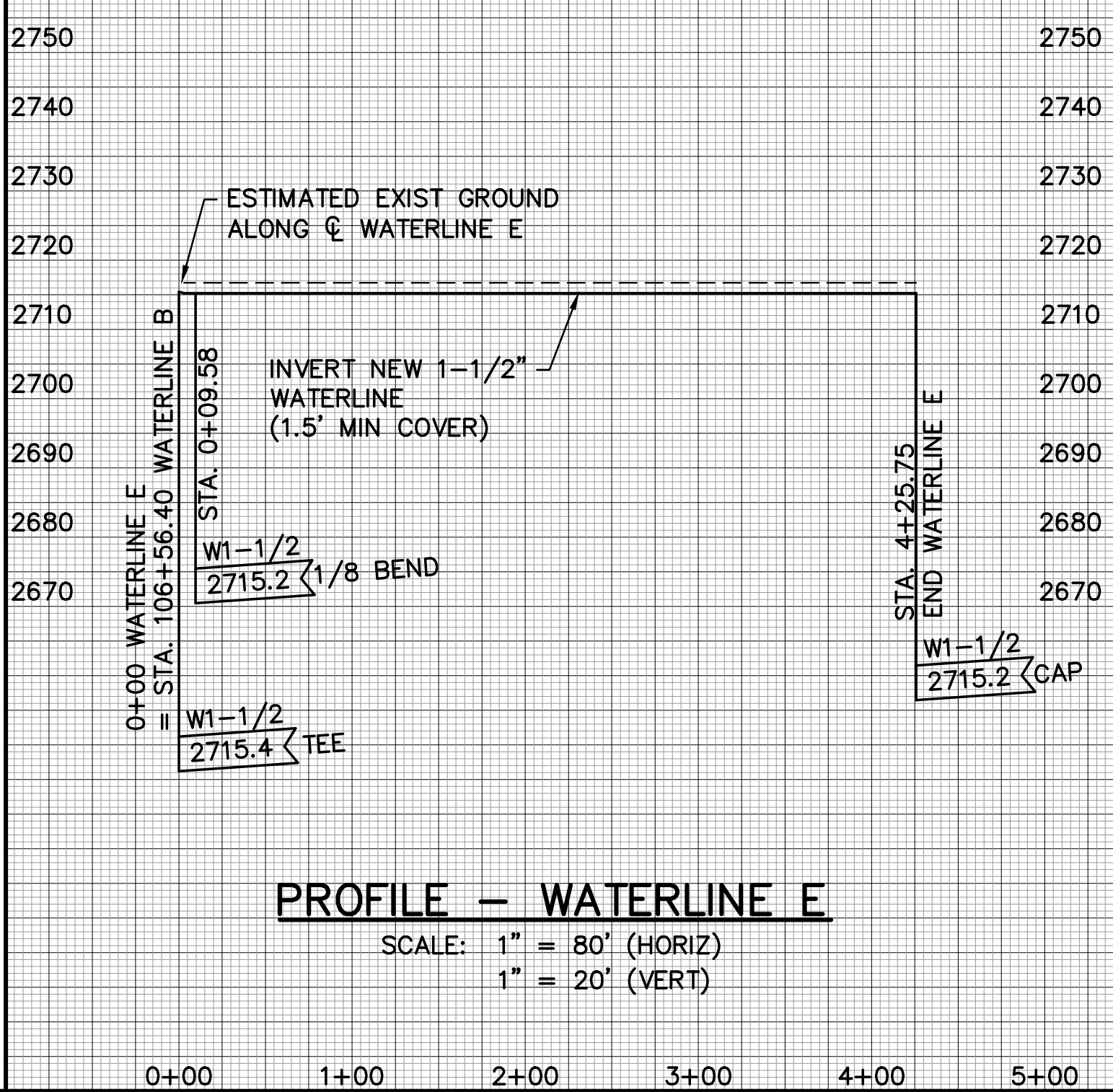
PLAN — WATERLINE E
SCALE: 1" = 80'



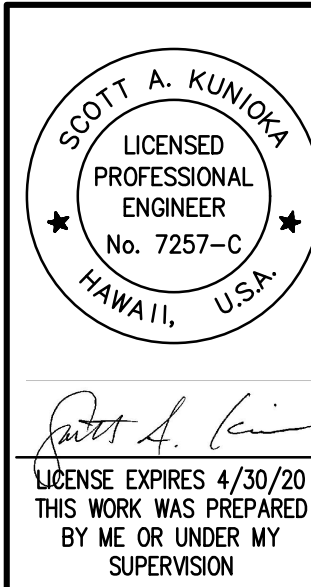
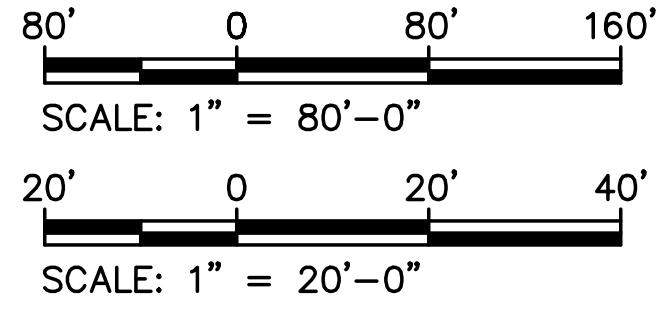
- LEGEND
- [L] SINGLE SERVICE LATERAL CONNECTION, SEE DETAIL 1 C-21
 - [D] DOUBLE SERVICE LATERAL CONNECTION, SEE DETAIL 1 C-21



PROFILE — WATERLINE D
SCALE: 1" = 80' (HORIZ)
1" = 20' (VERT)

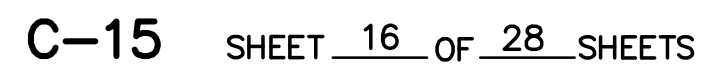


PROFILE — WATERLINE E
SCALE: 1" = 80' (HORIZ)
1" = 20' (VERT)

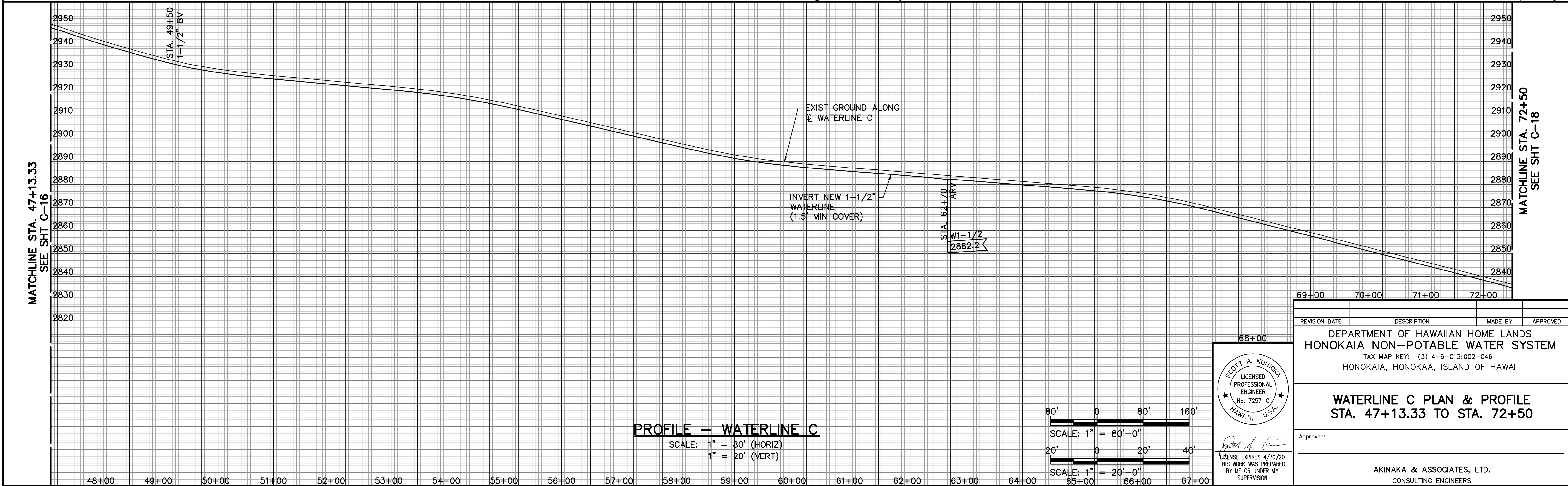
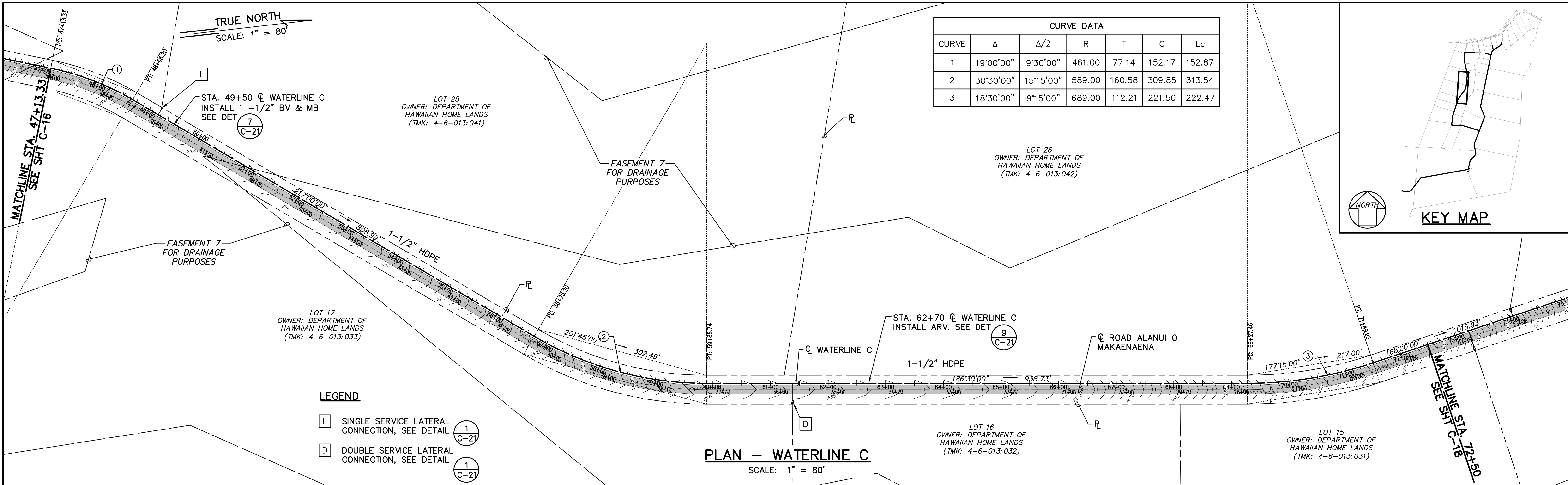


REVISION DATE	DESCRIPTION	MADE BY	APPROVED
	DEPARTMENT OF HAWAIIAN HOME LANDS HONOKAIA NON-POTABLE WATER SYSTEM TAX MAP KEY: (3) 4-6-013:002-046 HONOKAIA, HONOKAA, ISLAND OF HAWAII		
WATERLINE D & E PLAN & PROFILE			
Approved: _____			
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			
FILE	POCKET	FOLDER	NO.

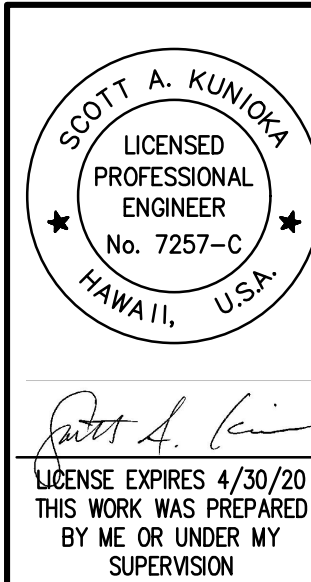
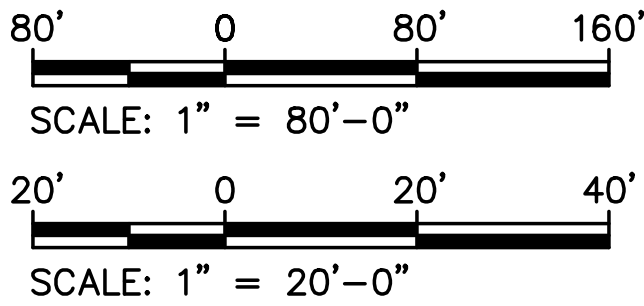
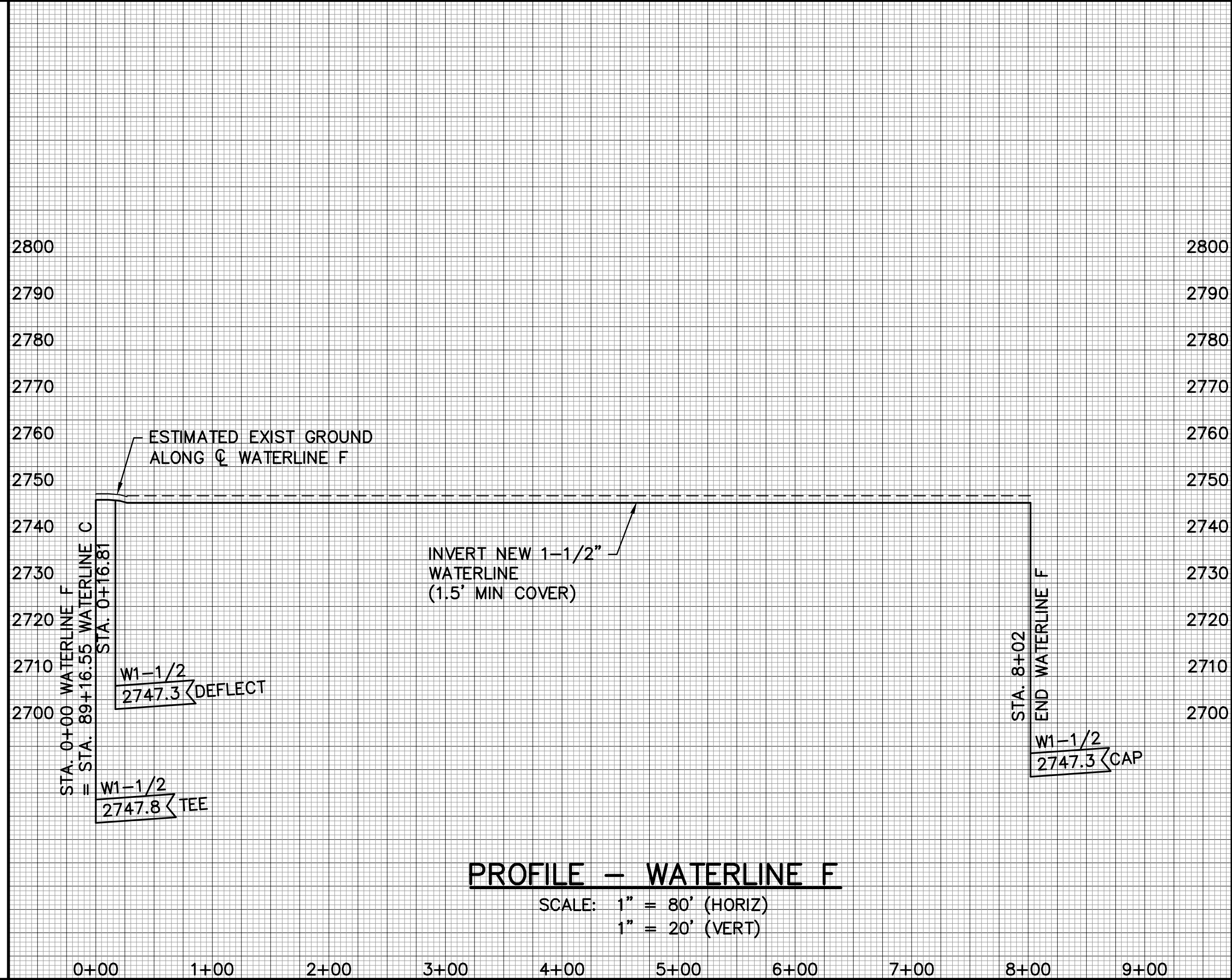
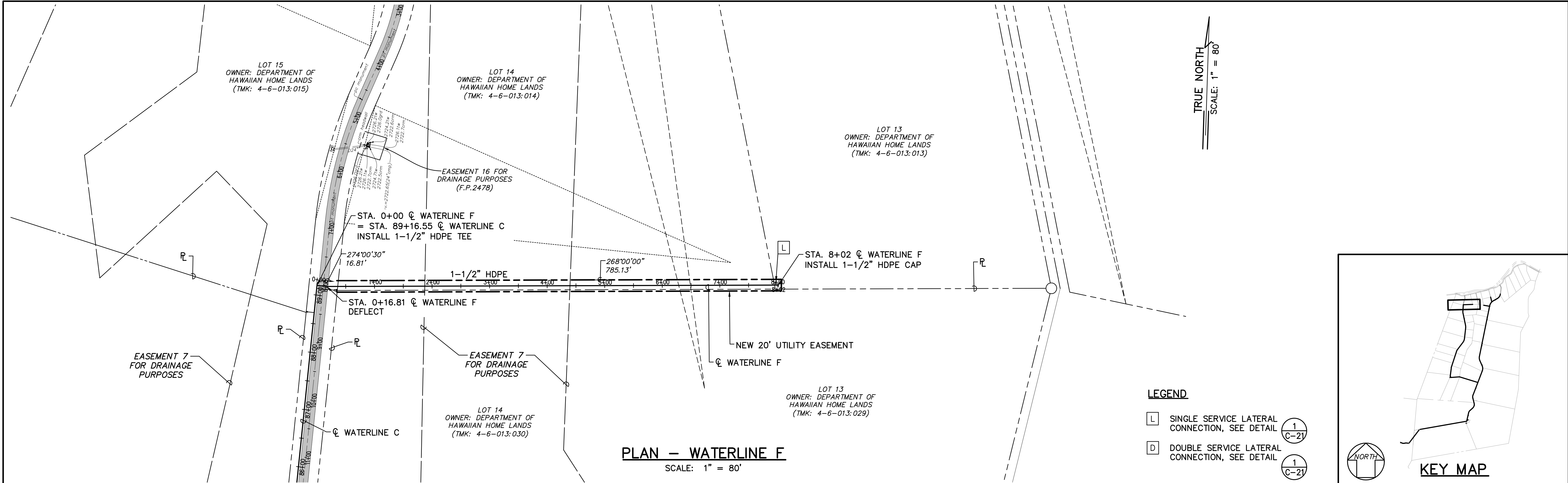
Last Save by: KNL
Last Saved: 5/29/2018
Plotted on: 8/30/2018



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Last Saved: 6/22/2018
Plotted on: 8/30/2018

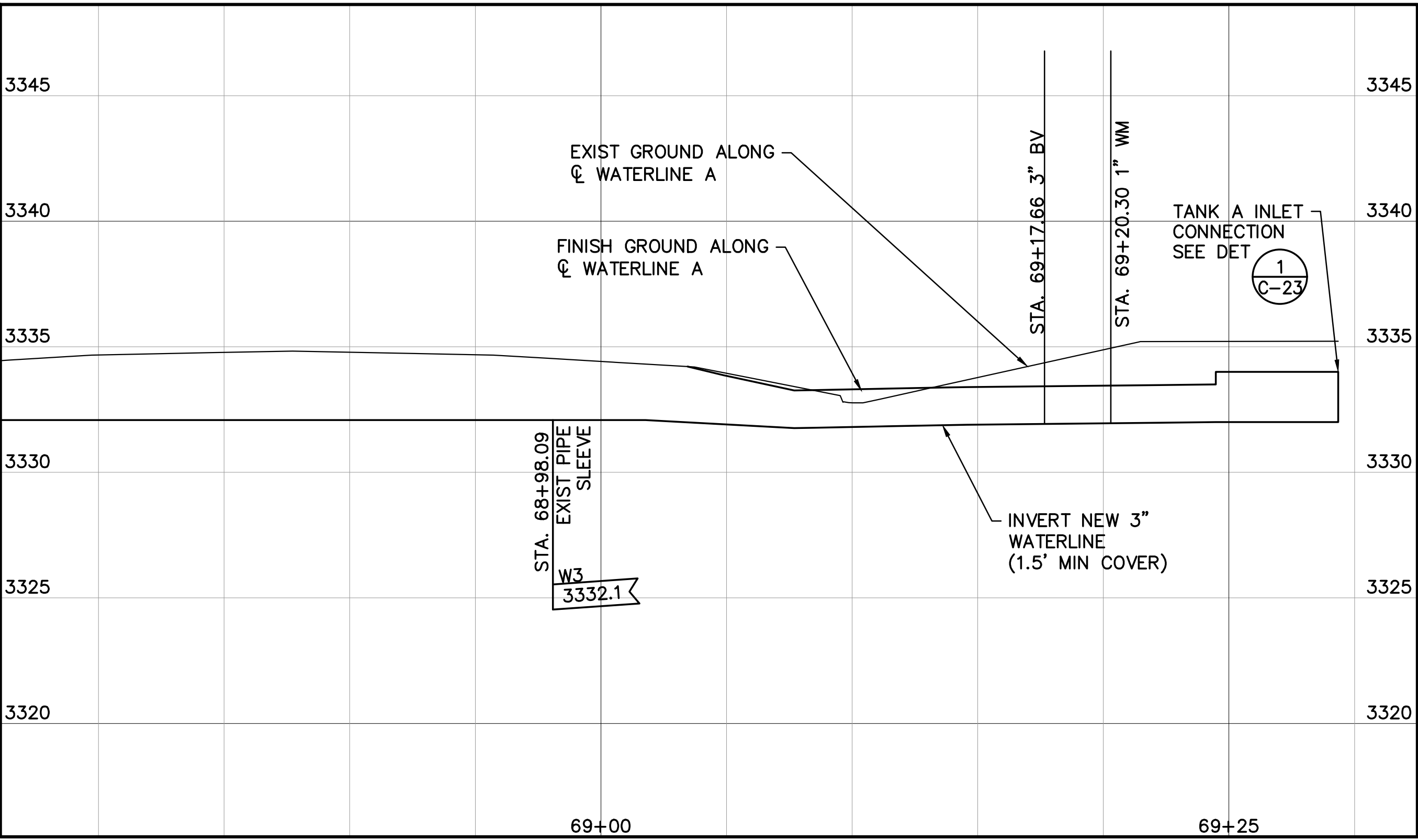


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Last Save by: LRS
Last Saved: 5/30/2018
Plotted on: 8/30/2018

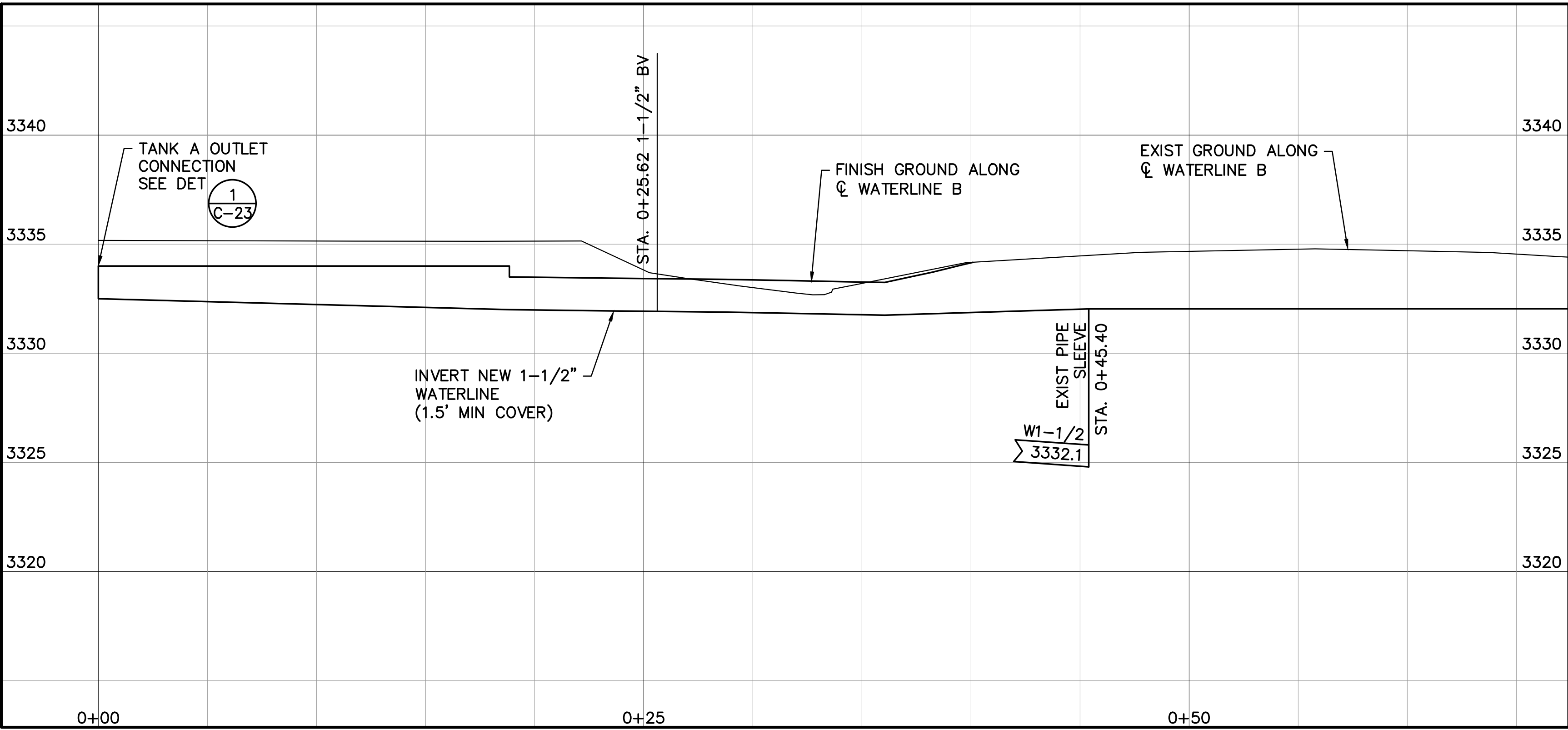


REVISION DATE	DESCRIPTION	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS HONOKAIA NON-POTABLE WATER SYSTEM TAX MAP KEY: (3) 4-6-013:002-046 HONOKAIA, HONOKAA, ISLAND OF HAWAII			
WATERLINE F PLAN & PROFILE			
Approved: _____			
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			
FILE	POCKET	FOLDER	NO.

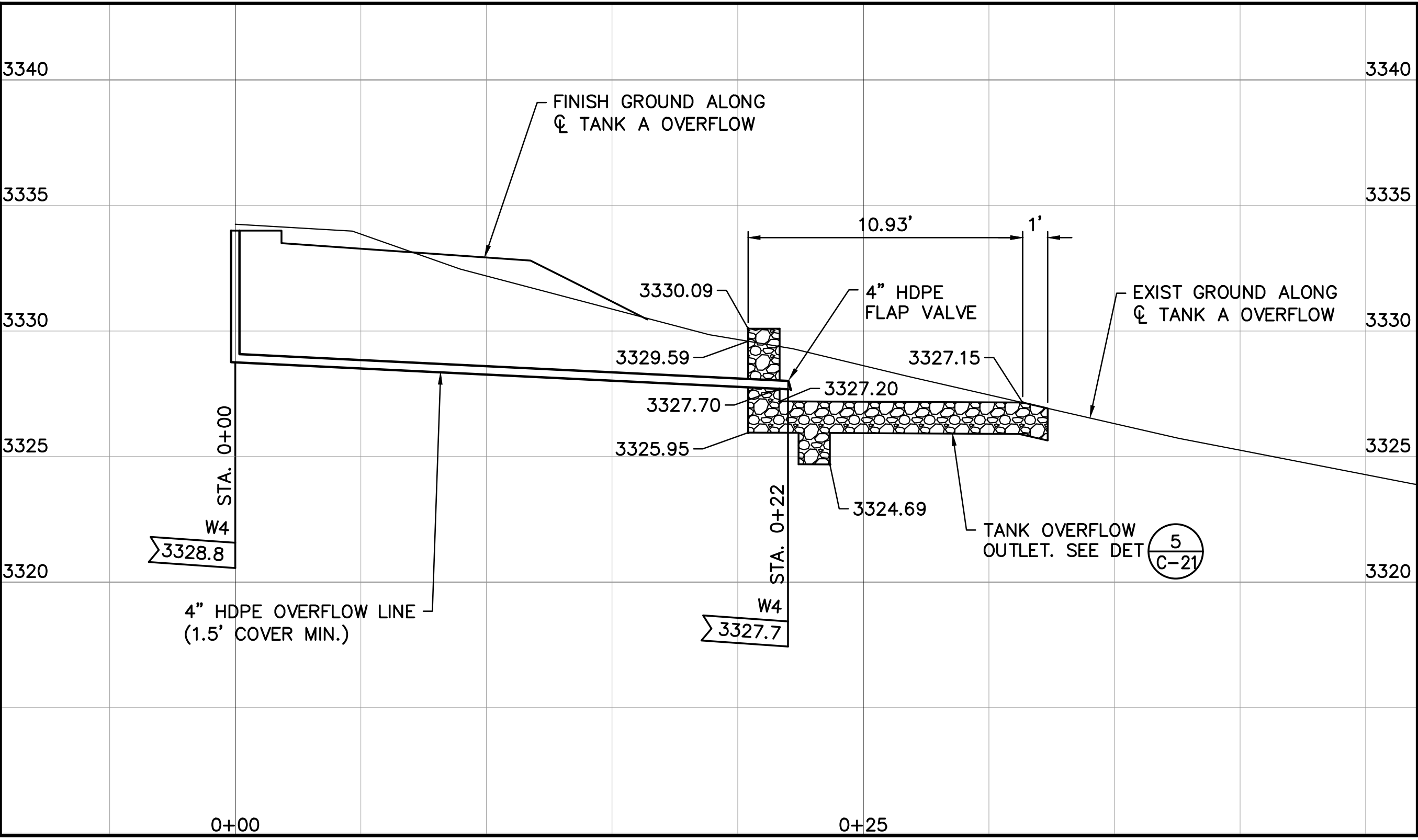
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Plotted on: 8/30/2018
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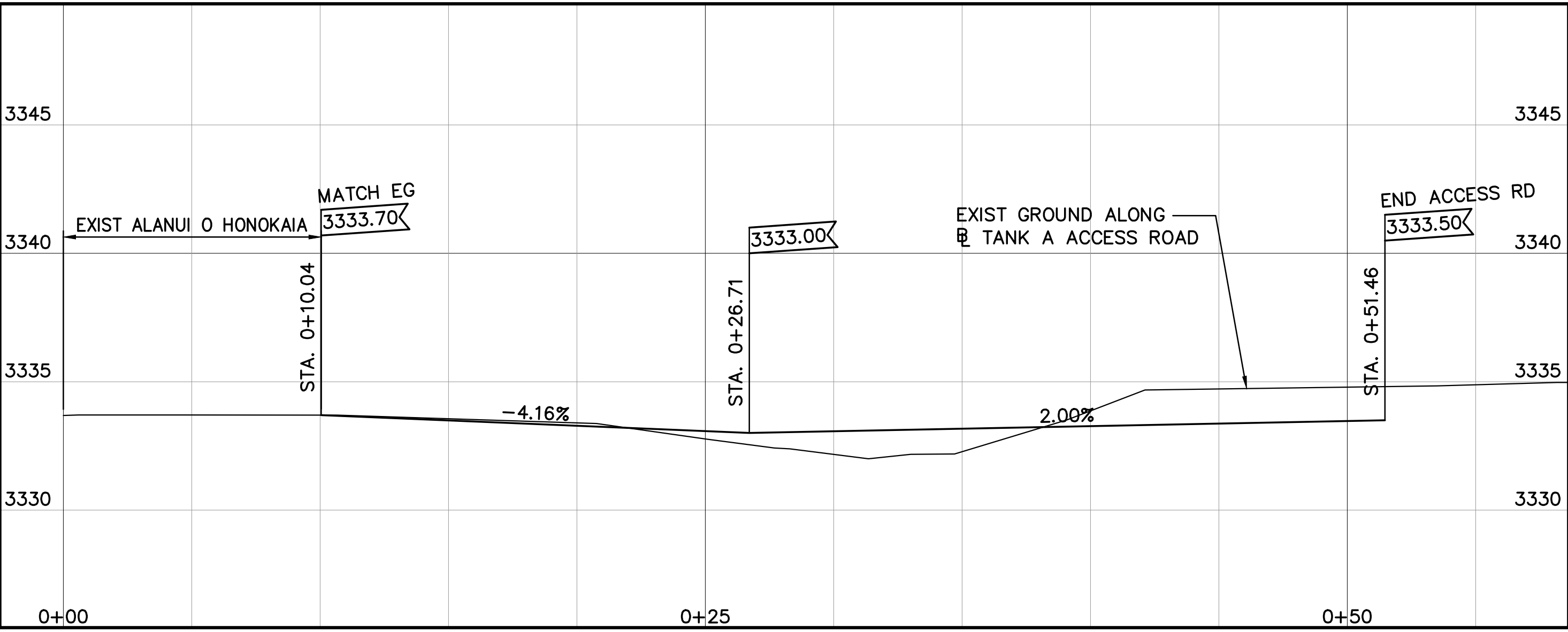
1 WATERLINE A PROFILE - STA. 68+76.09 TO END
C-20 SCALE: 1" = 4' (HORIZ)
1" = 4' (VERT)



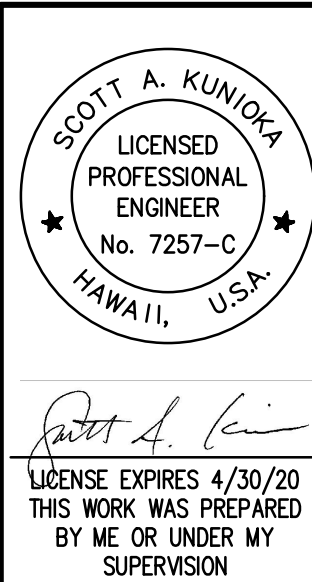
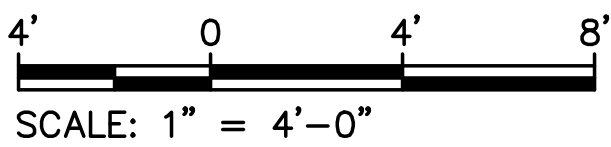
2 WATERLINE B PROFILE - STA. 0+00 TO STA. 0+67.40
C-20 SCALE: 1" = 4' (HORIZ)
1" = 4' (VERT)



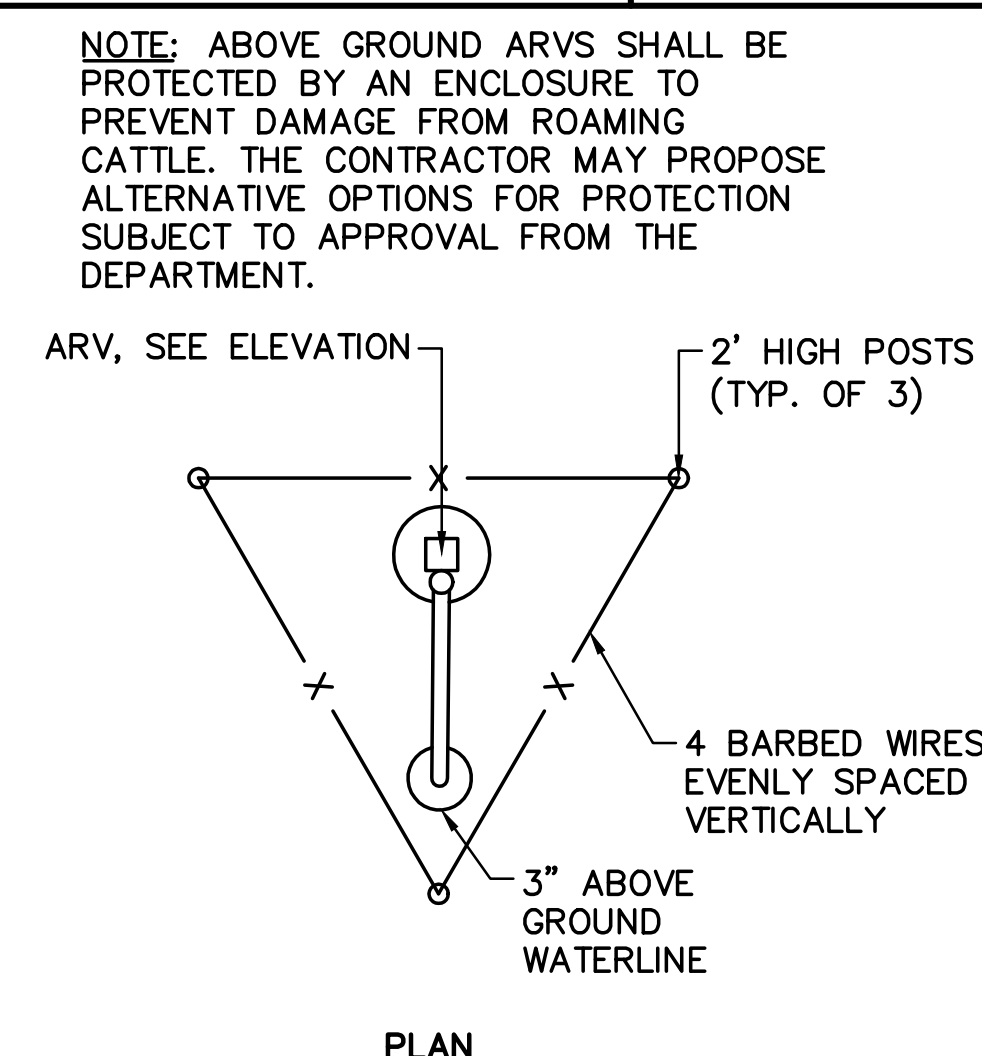
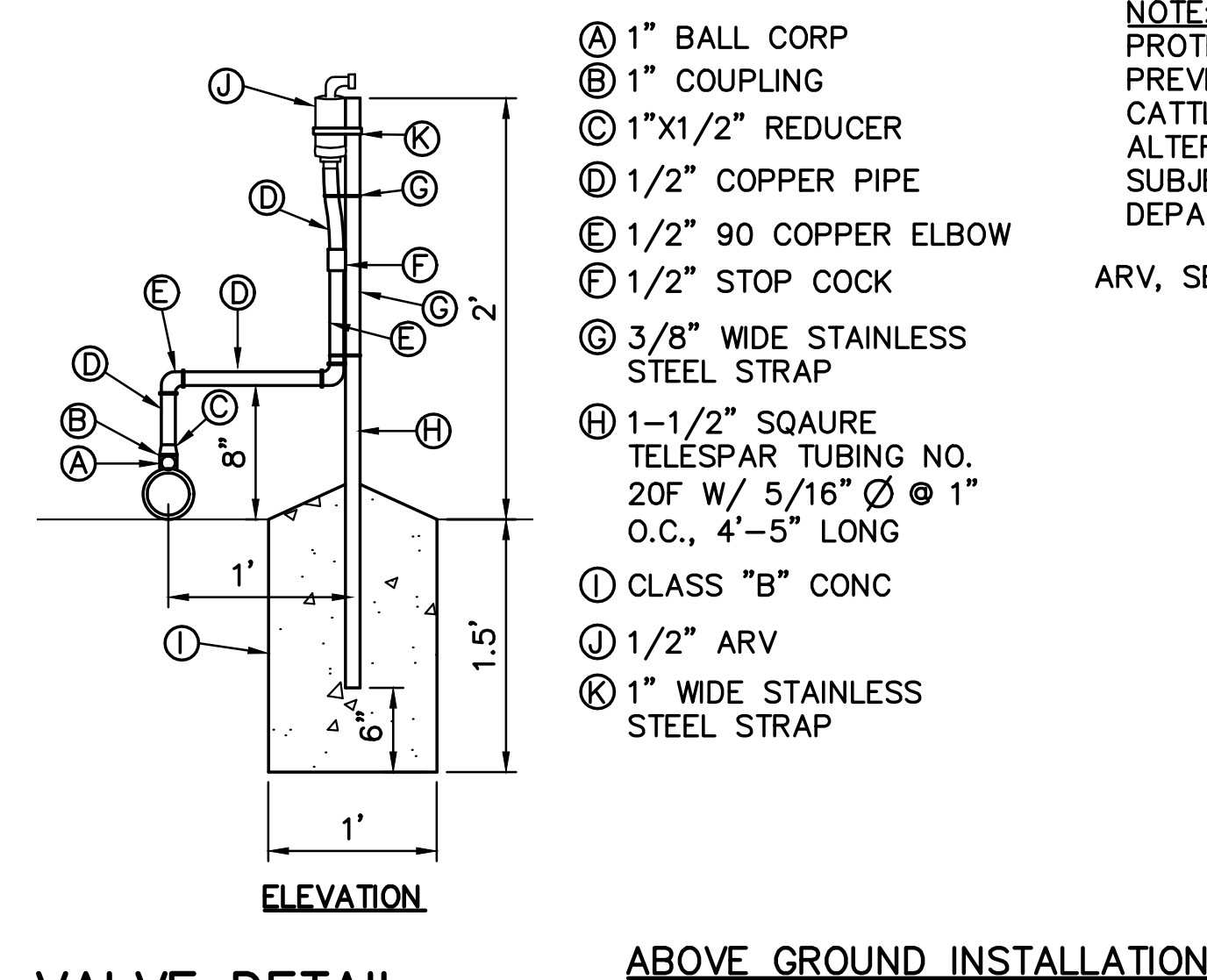
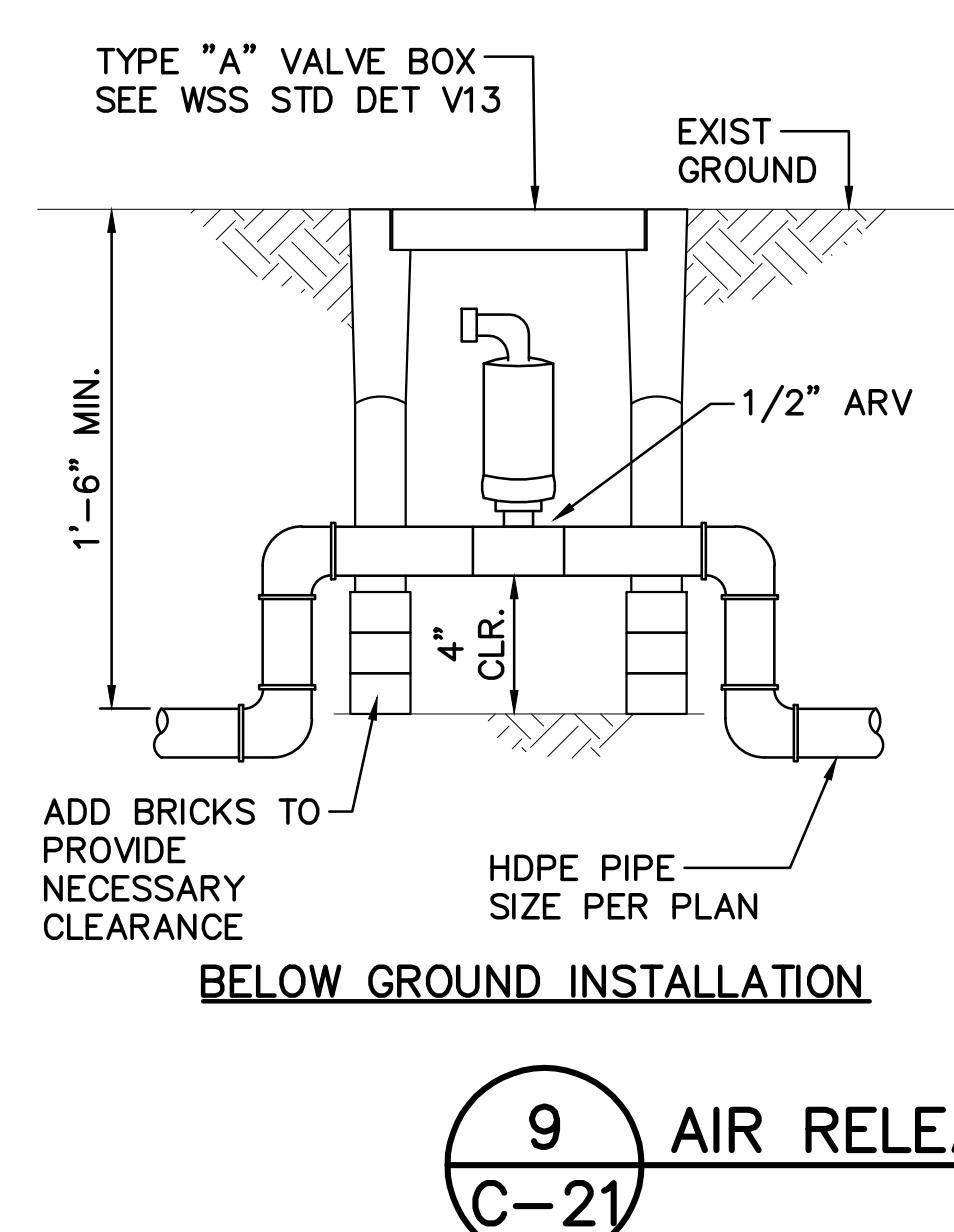
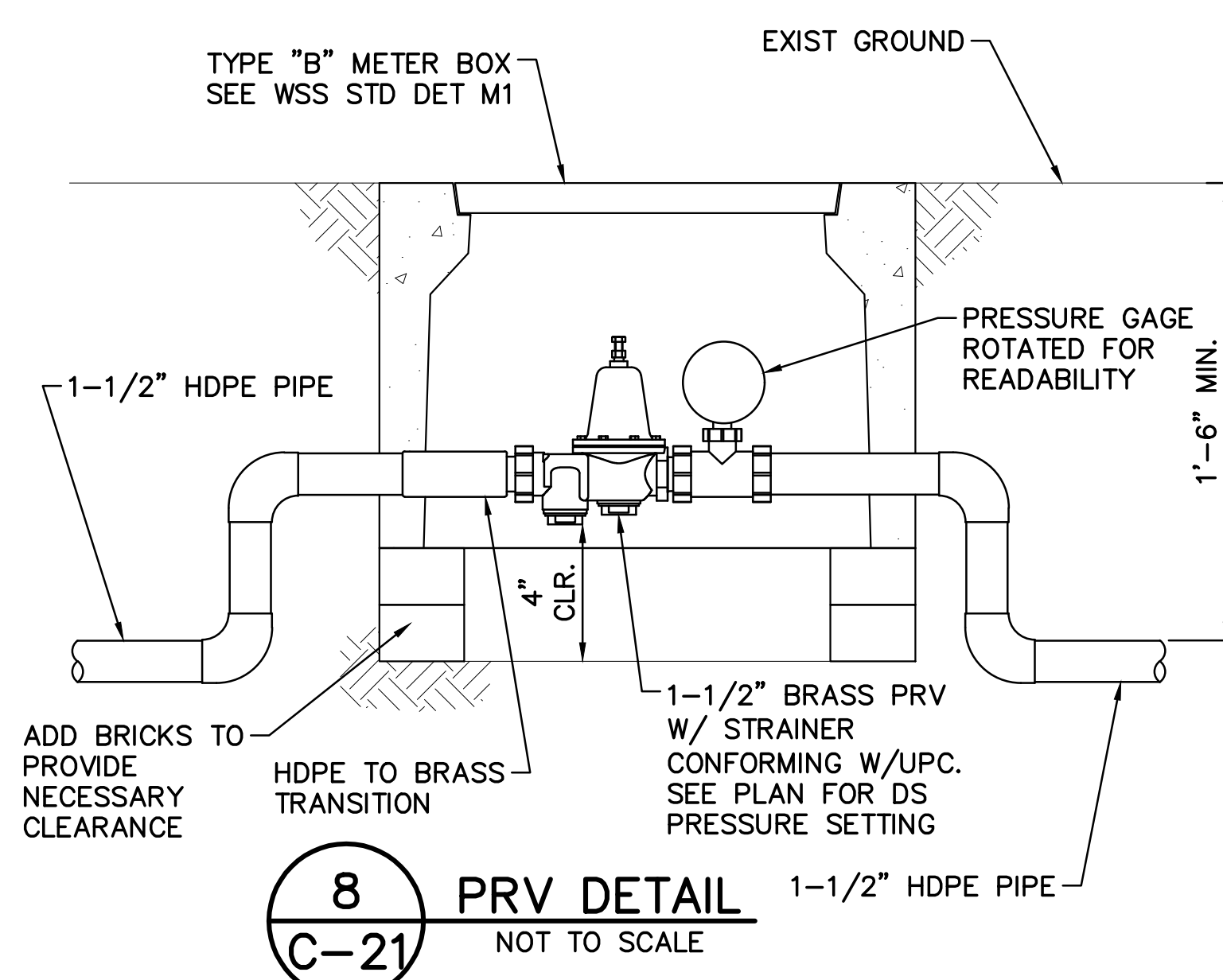
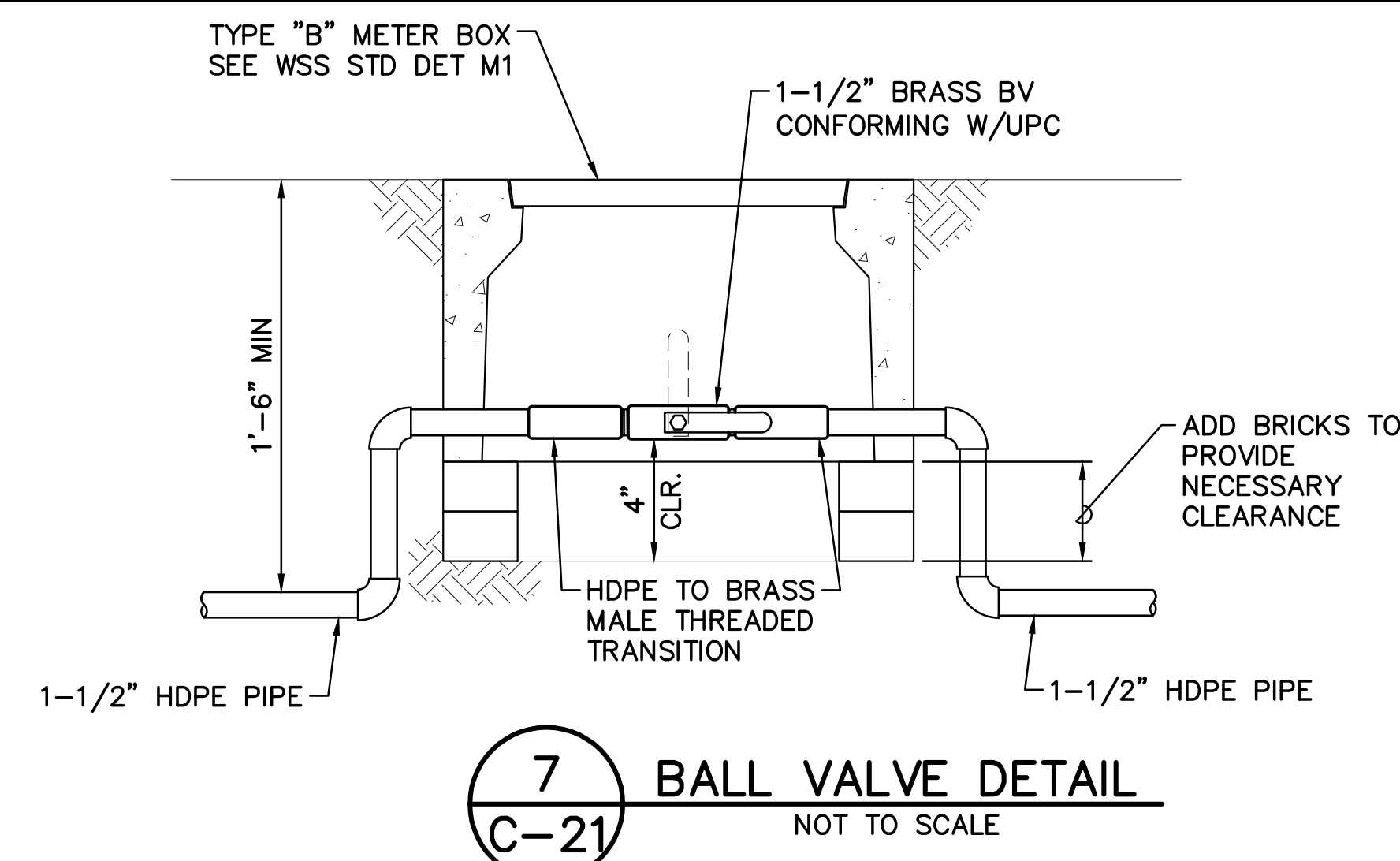
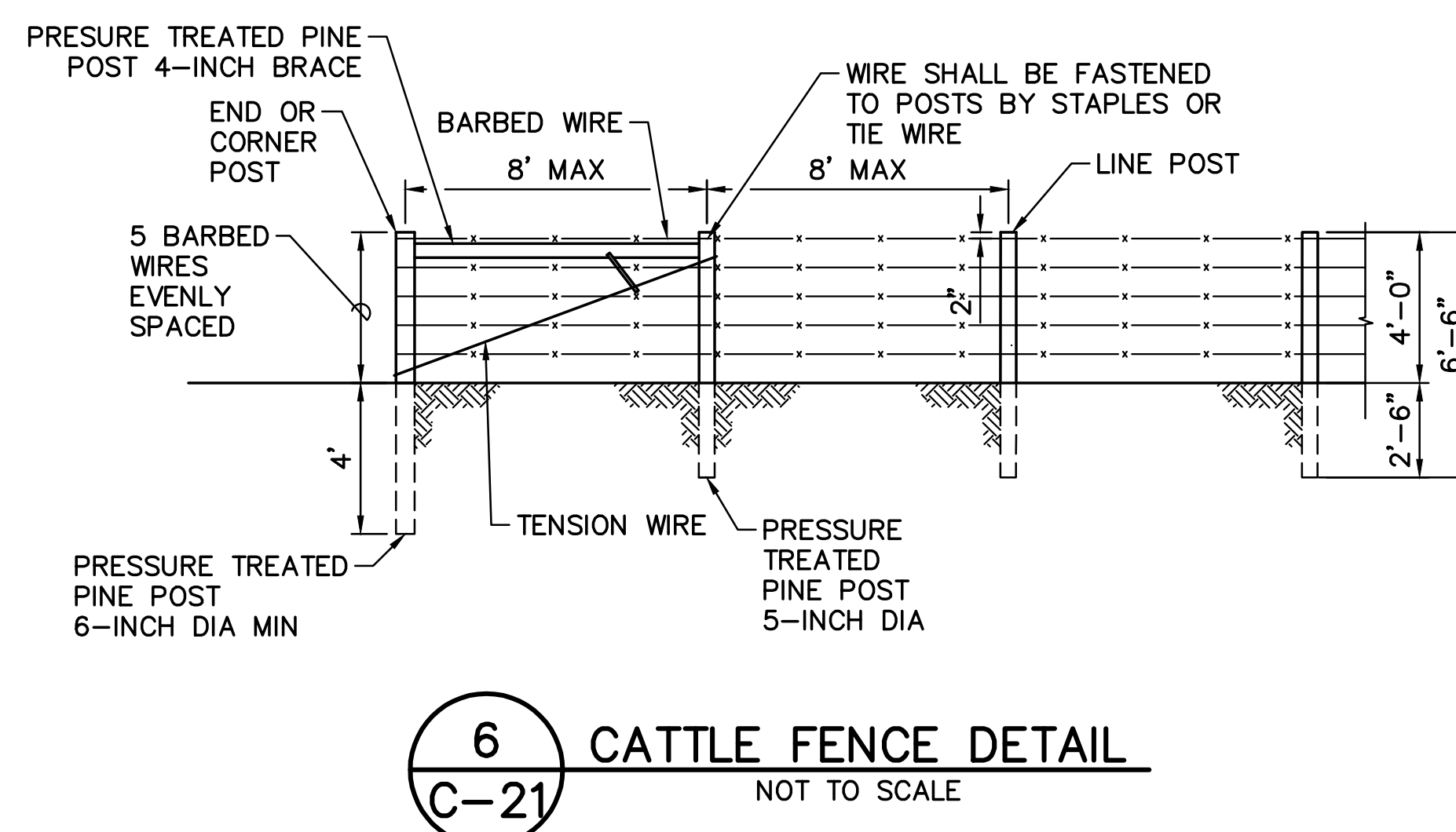
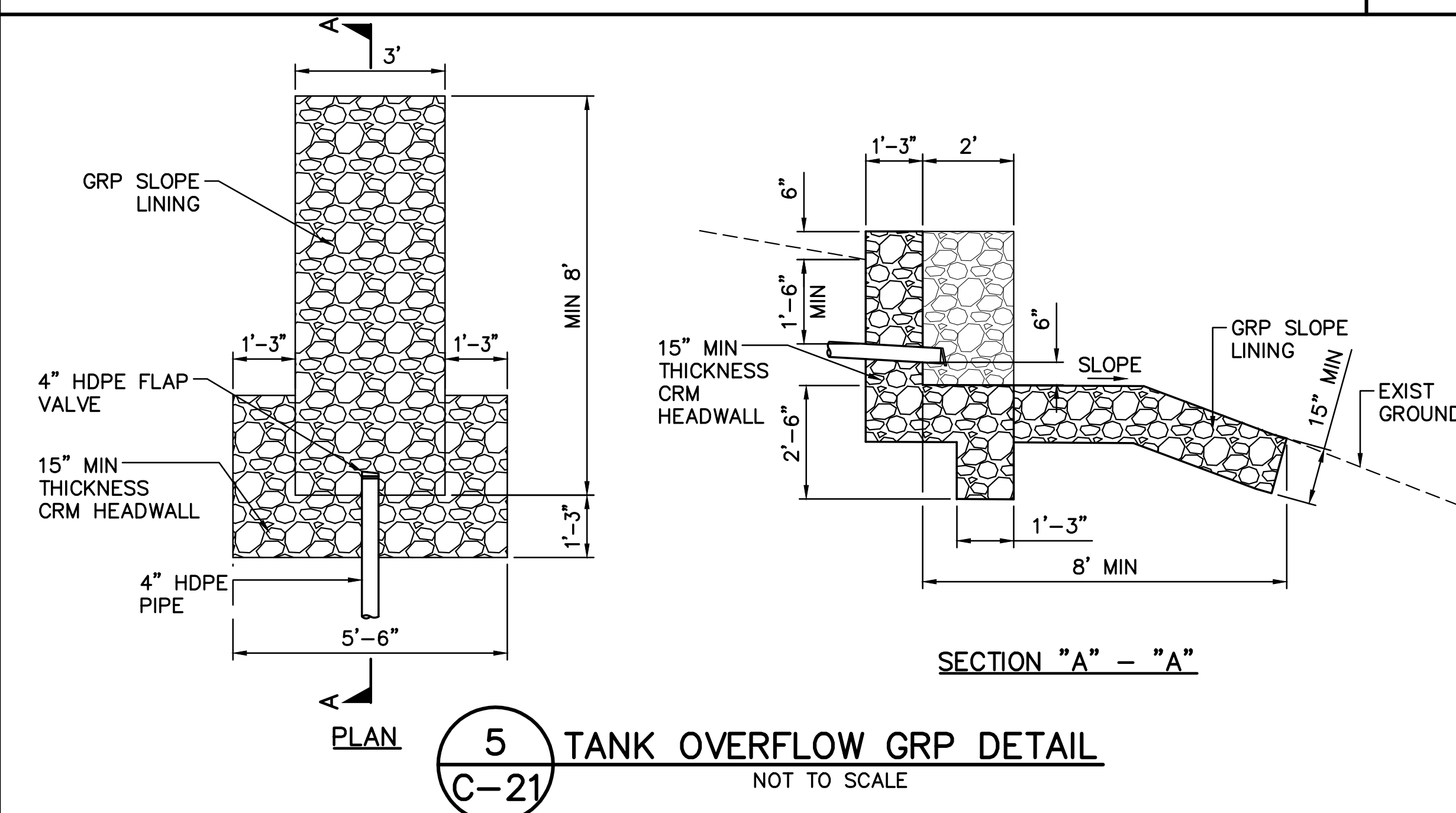
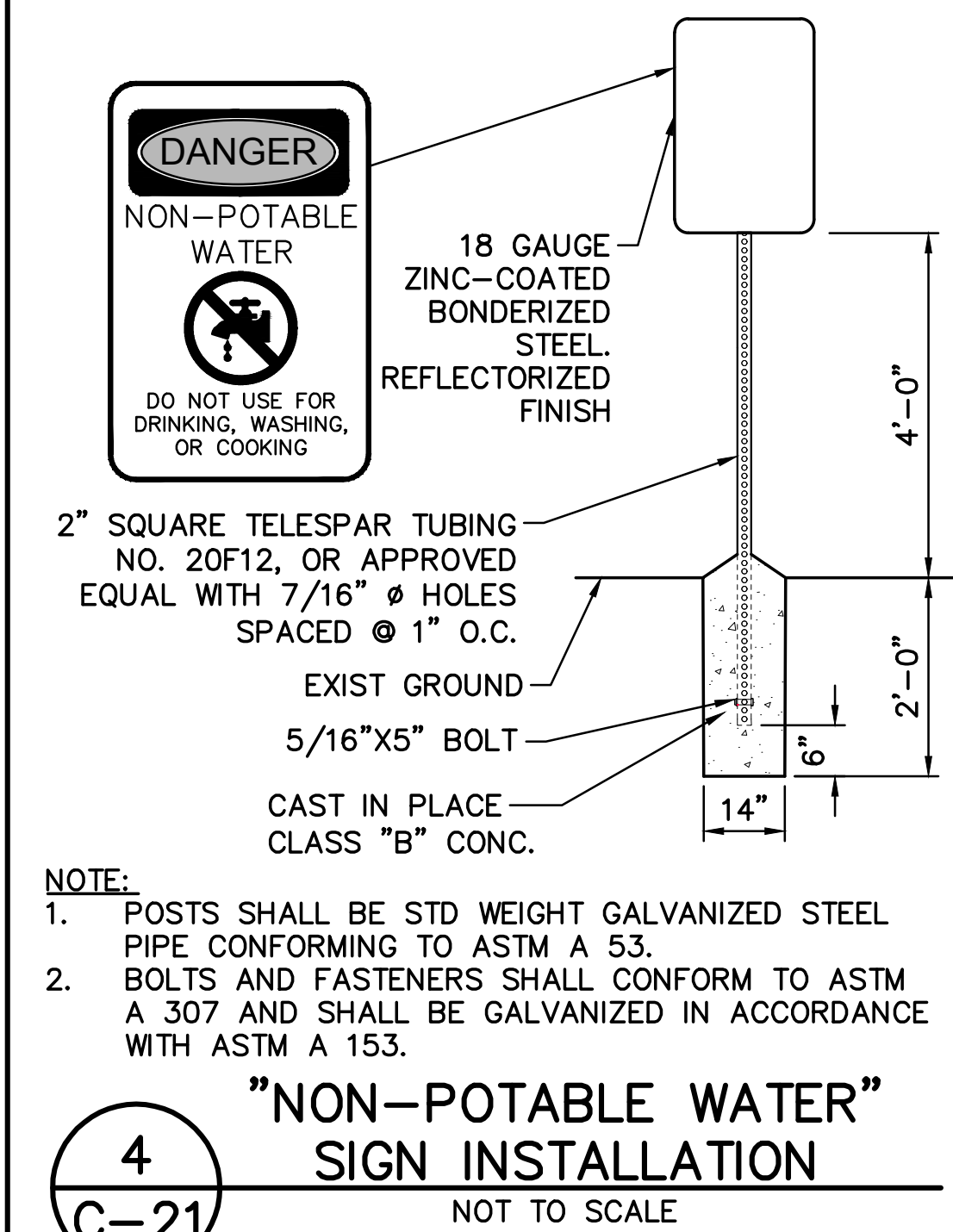
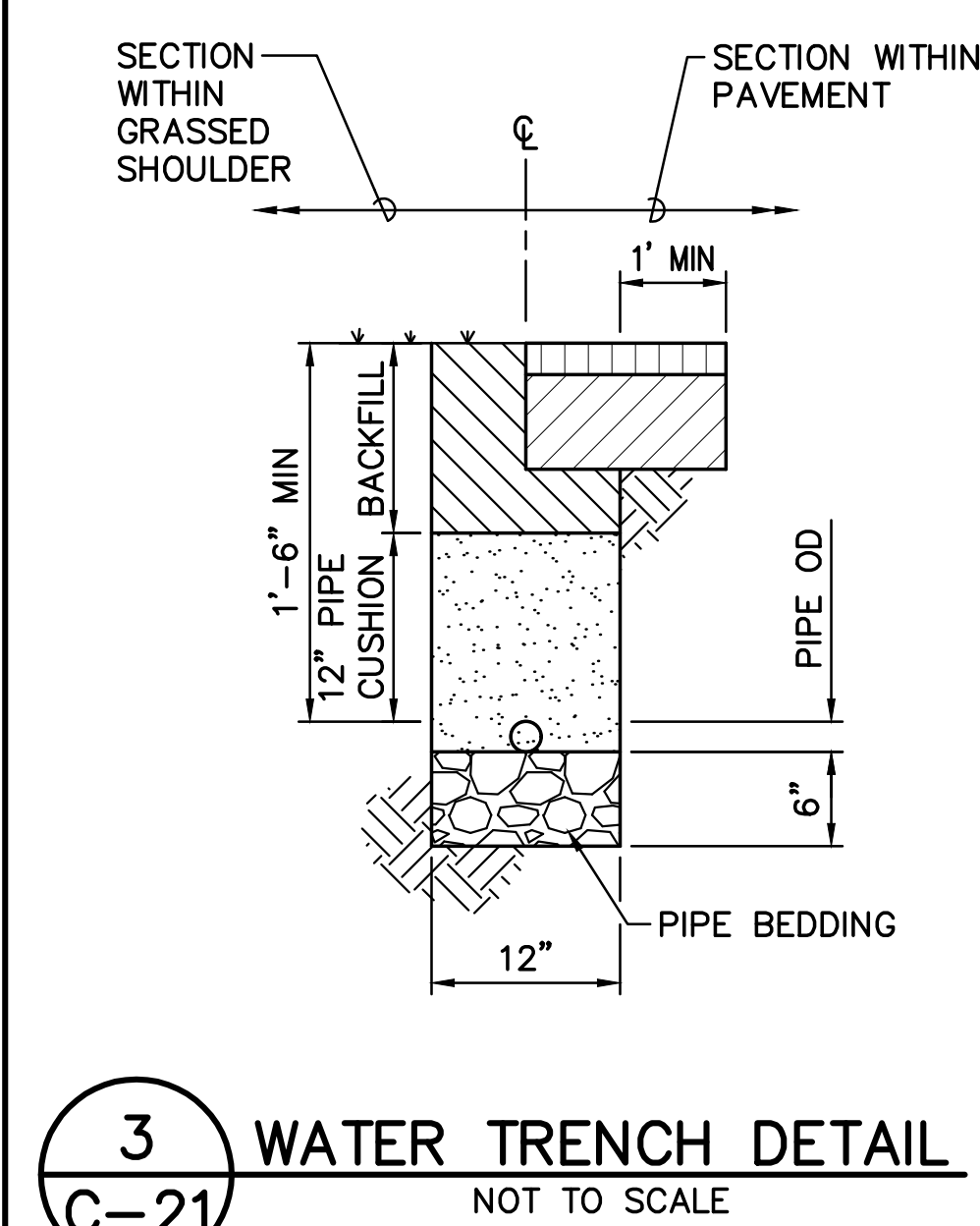
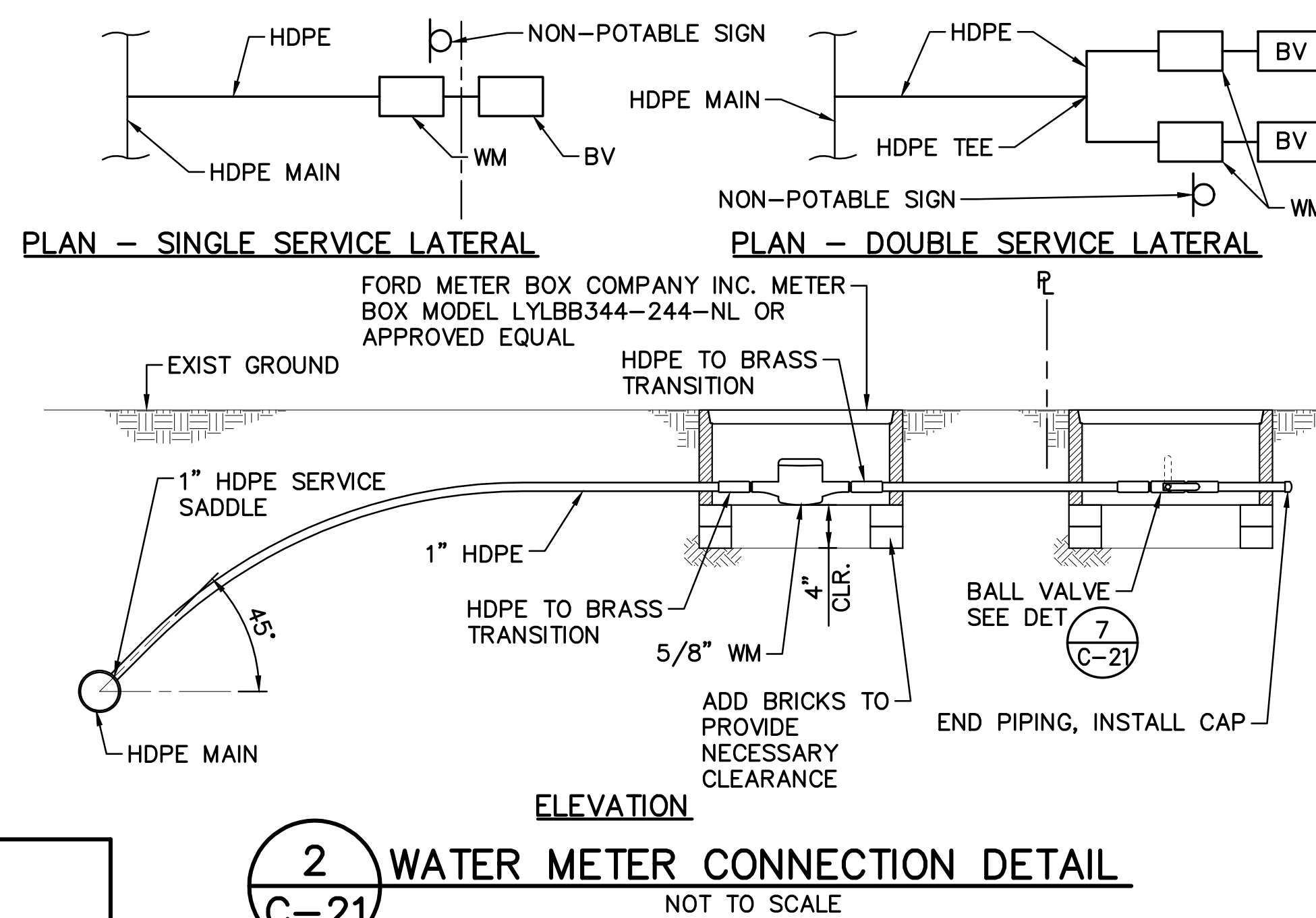
3 TANK A OVERFLOW LINE PROFILE
C-20 SCALE: 1" = 4' (HORIZ)
1" = 4' (VERT)



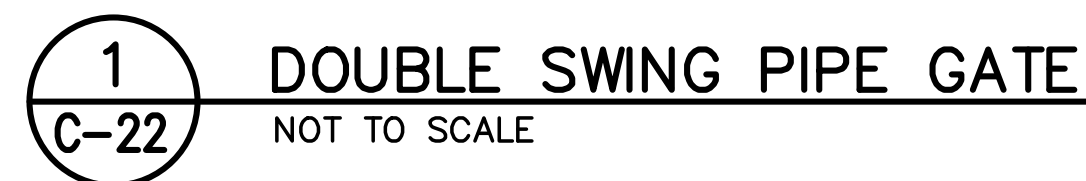
4 TANK A ACCESS ROAD PROFILE
C-20 SCALE: 1" = 4' (HORIZ)
1" = 4' (VERT)



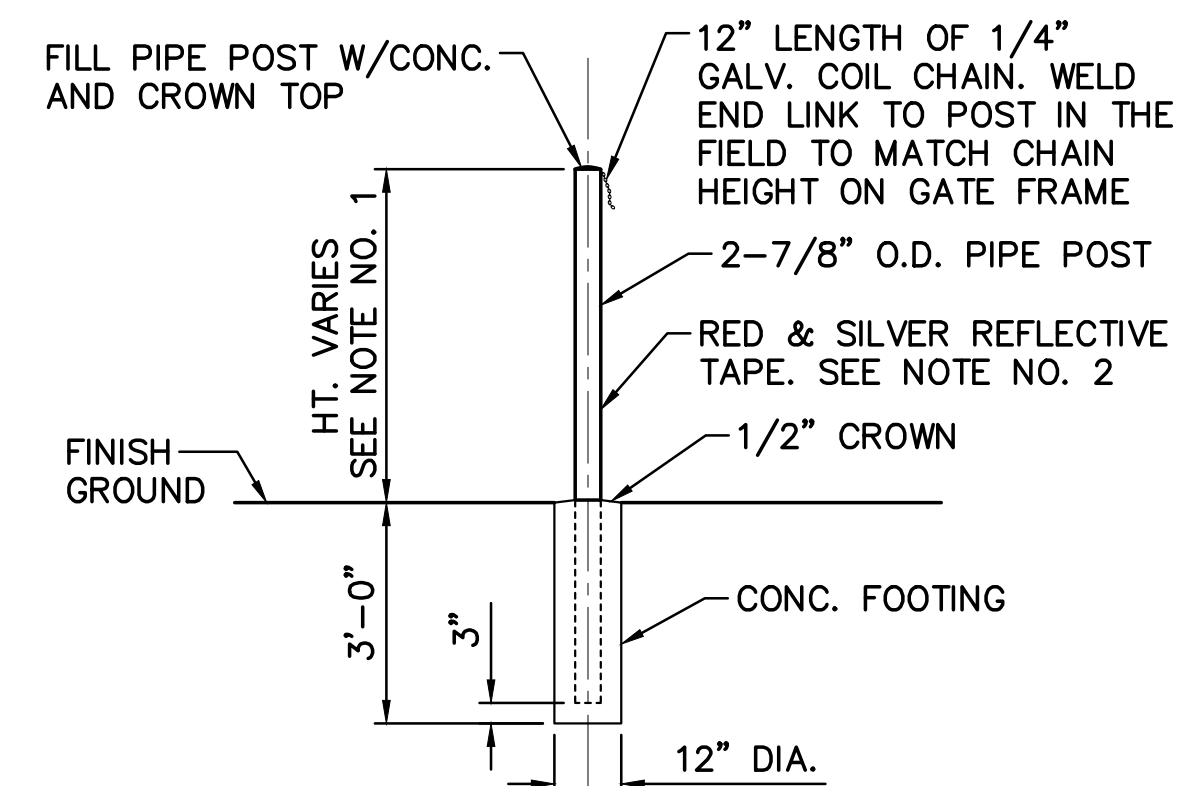
REVISION DATE	DESCRIPTION	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS HONOKAIA NON-POTABLE WATER SYSTEM TAX MAP KEY: (3) 4-6-013:002-046 HONOKAIA, HONOKAA, ISLAND OF HAWAII			
MISCELLANEOUS PROFILES			
Approved: _____			
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			
FILE	POCKET	FOLDER	NO.



REVISION DATE	DESCRIPTION	MADE BY	APPROVED								
DEPARTMENT OF HAWAIIAN HOME LANDS HONOKAIA NON-POTABLE WATER SYSTEM TAX MAP KEY: (3) 4-6-013:002-046 HONOKAIA, HONOKAA, ISLAND OF HAWAII											
DETAILS											
Approved: _____ _____ _____											
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS											
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FILE	POCKET	FOLDER	NO.								



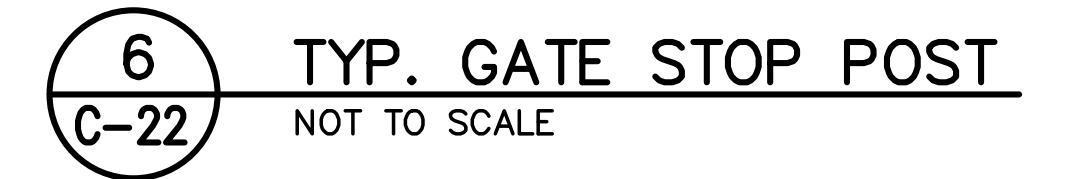
-
- The image contains three technical drawings of a drop rod assembly:
- SECTION "X-X"**: A cross-sectional view showing the assembly of the drop rod into the gate frame. It includes a 1-3/8" O.D. DROP ROD, a 1-7/8" O.D. PIPE SLEEVE, and a 3/8" x 1/4" BAR. A dimension of 5/16" is shown for the gap between the rod and sleeve.
 - FRONT ELEVATION**: A side view of the drop rod assembly. It shows the 1-7/8" O.D. x 2" LONG PIPE SLEEVE, the GATE FRAME, and the 3/8" DIA. x 3/4" LONG BAR WELDED TO DROP ROD. It also indicates the 1/2" CROWN FINISH GROUND and the 1'-0" height of the CONC. FOOTING. A dimension of 8" SQ. is shown for the base.
 - SLEEVE DETAIL**: A detailed view of the sleeve and drop rod connection. It shows the 1-3/8" O.D. PIPE DROP ROD, the 2-3/8" O.D. PIPE SLEEVE WITH 1/4" THICK x 5" SQ. STEEL PLATE WELDED TO BOTTOM, and the 3/8" x 1/4" BAR. Dimensions include 2" for the sleeve height, 3/4" for the bar height, and 1/2" for the sleeve width.



- NOTES:**
1. HEIGHT OF POST TO MATCH HEIGHT OF GATE IN THE OPEN POSITION UNLESS OTHERWISE INDICATED
 2. WRAP REFLECTIVE TAPE AROUND THE ENTIRE POST. ALTERNATE 12" BANDS OF RED AND SILVER



- NOTE:**
- 8" THICK CONC. SLAB
SHALL BE 3' SQUARE
UNLESS OTHERWISE
INDICATED ON THE PLANS.
- EACH WAY
- NOTES:**
1. OMIT 8" THICK CONC. SLAB & REBARS WHEN GATE POST IS INSTALLED IN CONC. WALKS & PAVEMENTS OF THE GROUND.
 2. WHERE THE EXISTING GRADE SLOPES, THE FINISH GRADE OF THE 8" SLAB SHALL FOLLOW THE GENERAL SLOPE

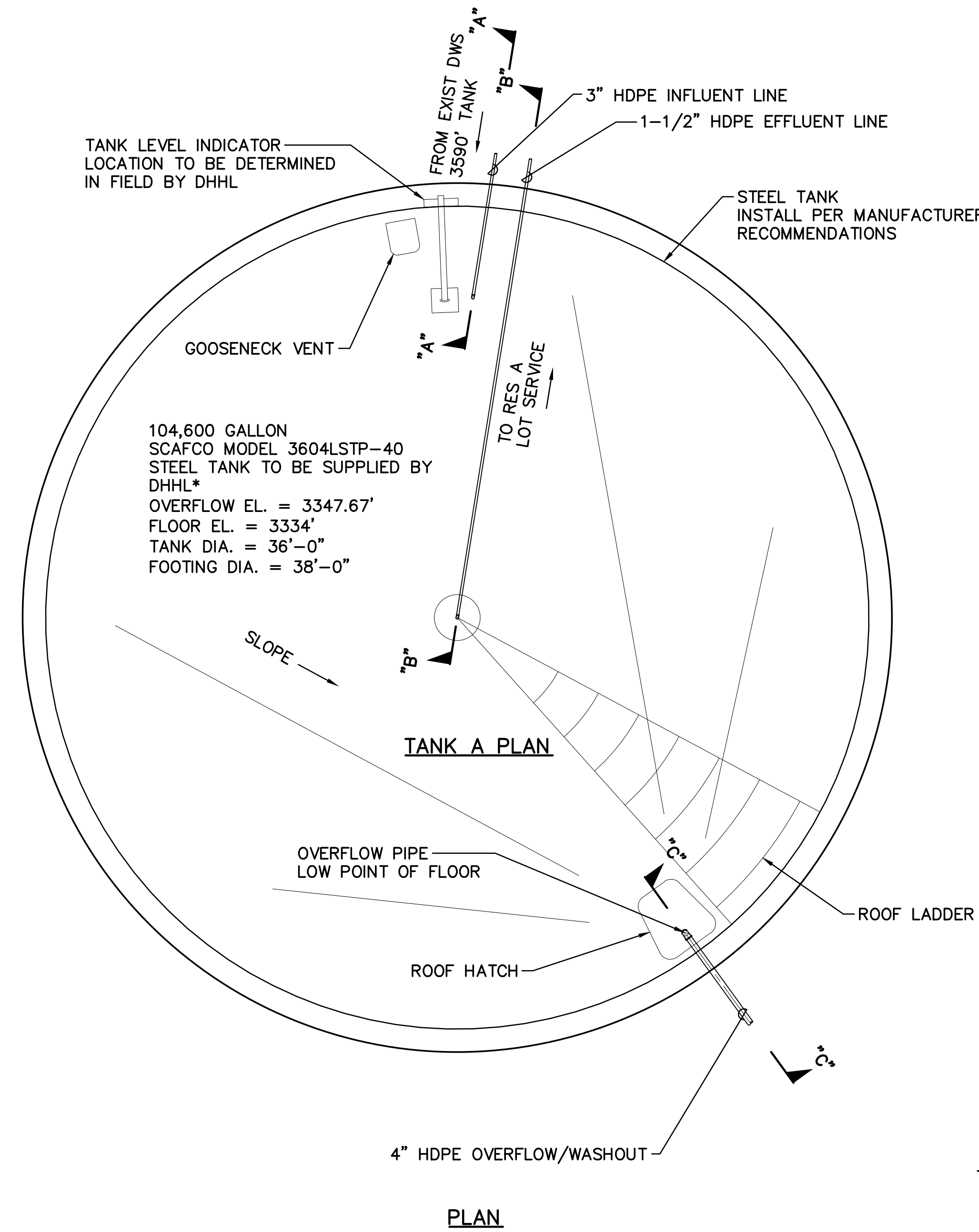


REVISION DATE	DESCRIPTION	MADE BY	APPROVED
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DETAILS			
Approved: _____ _____ _____			
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			



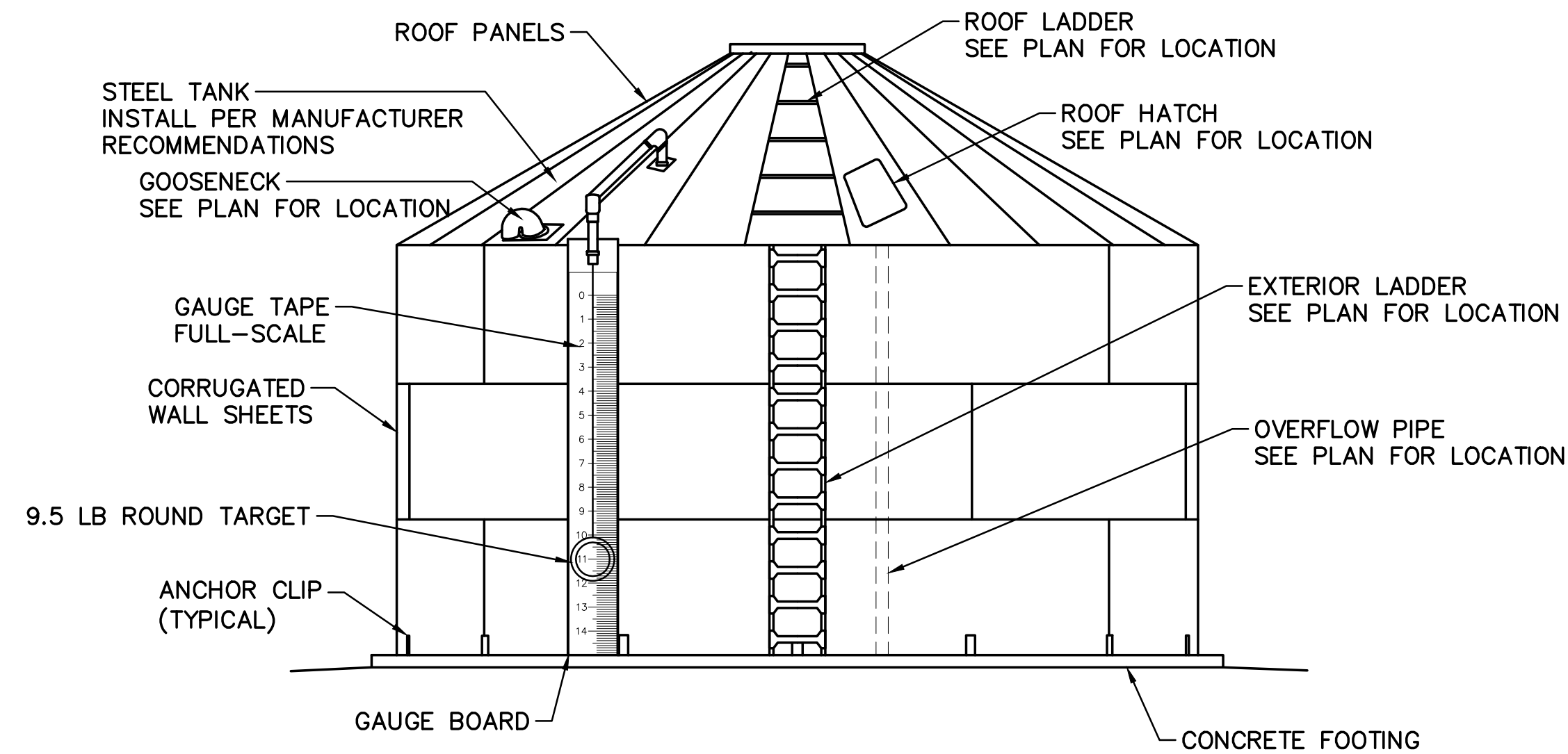
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Plotted on: 8/30/2018
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DSGN\310 plans\DHHL1401-Details 3.dwg

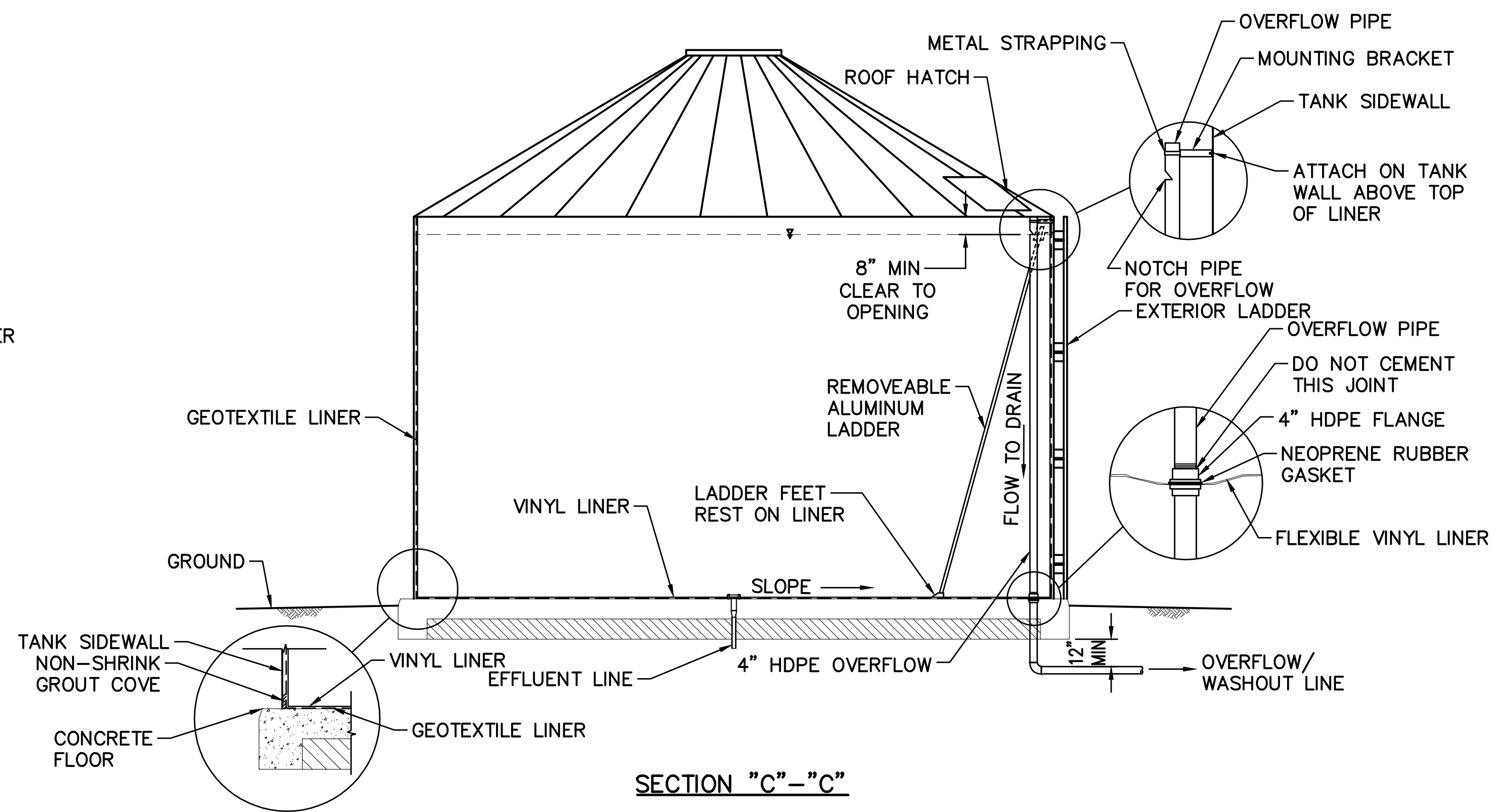


*NOTE: TANK TO BE REUSED FROM A PREVIOUS PROJECT THAT WAS OUTFITTED WITH 12\"/>

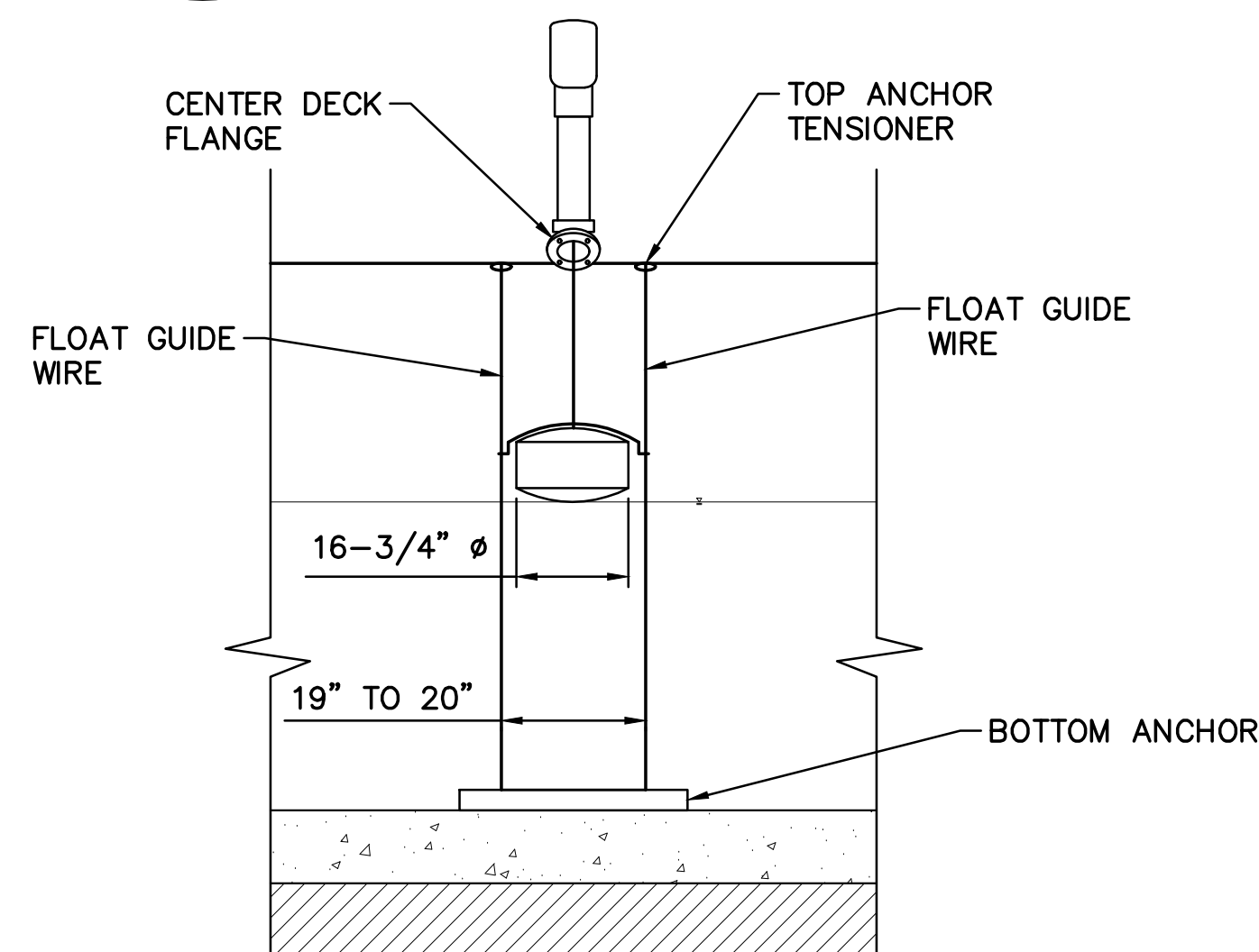
1 TANK DETAILS
C-23 NOT TO SCALE



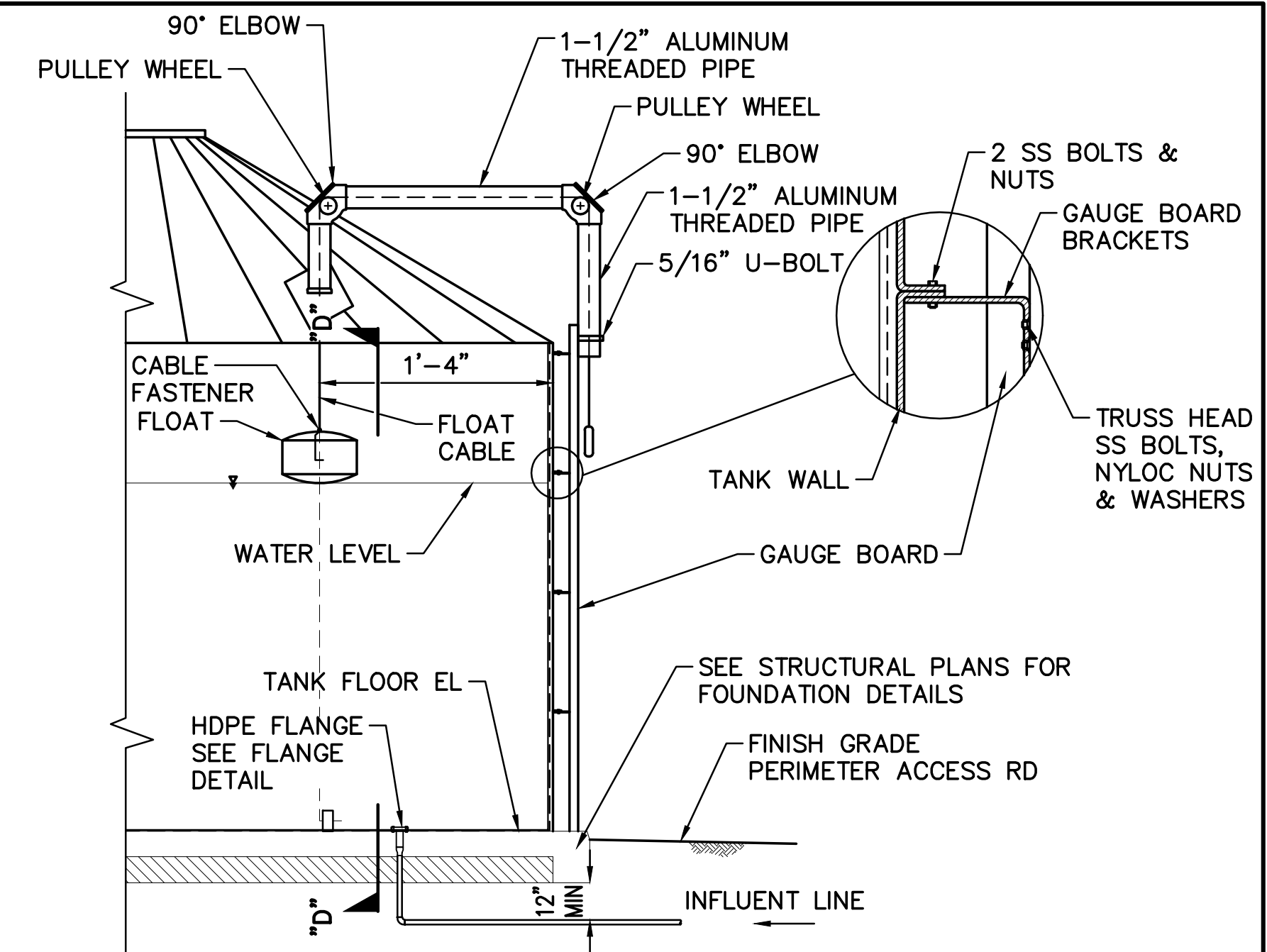
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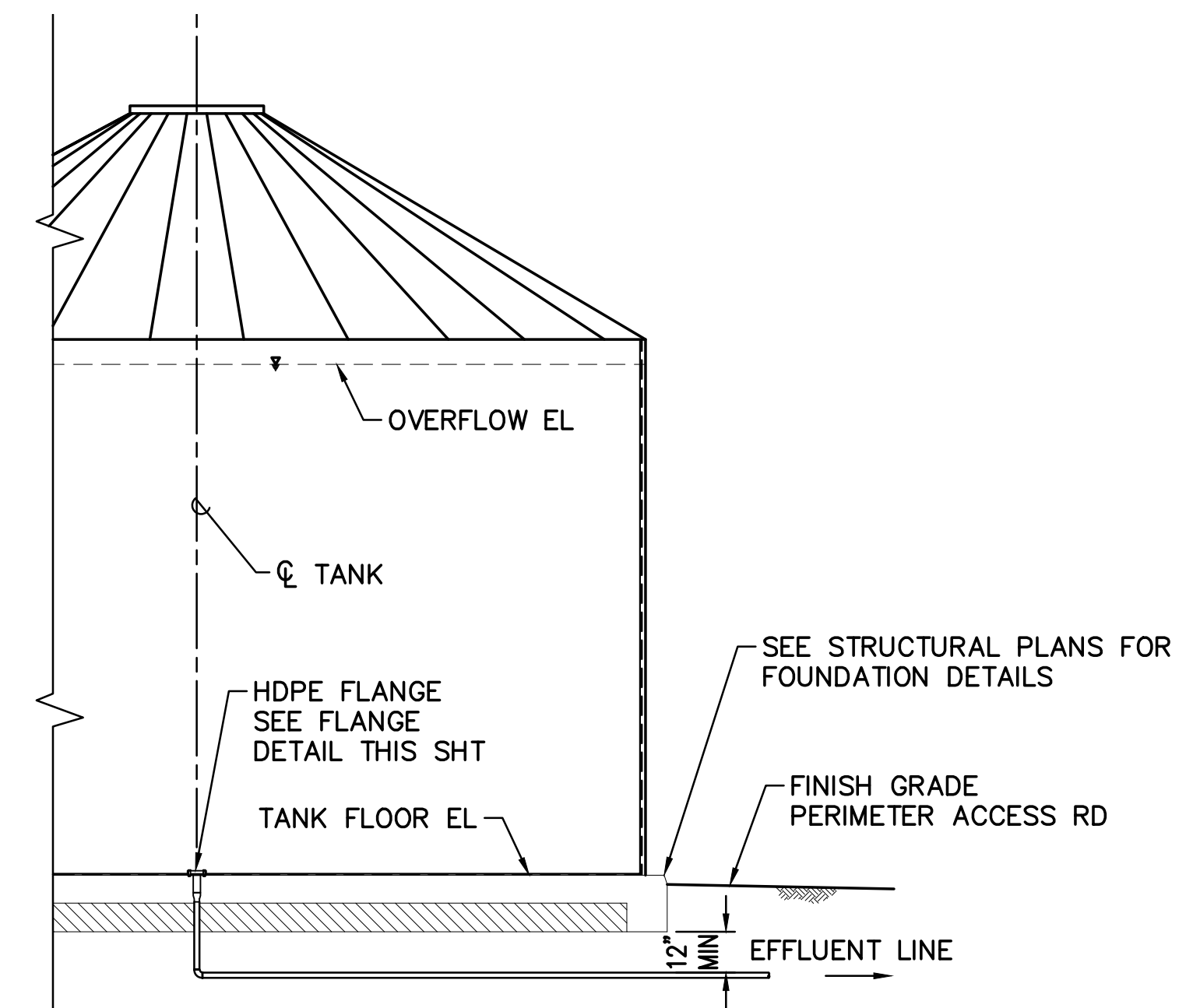
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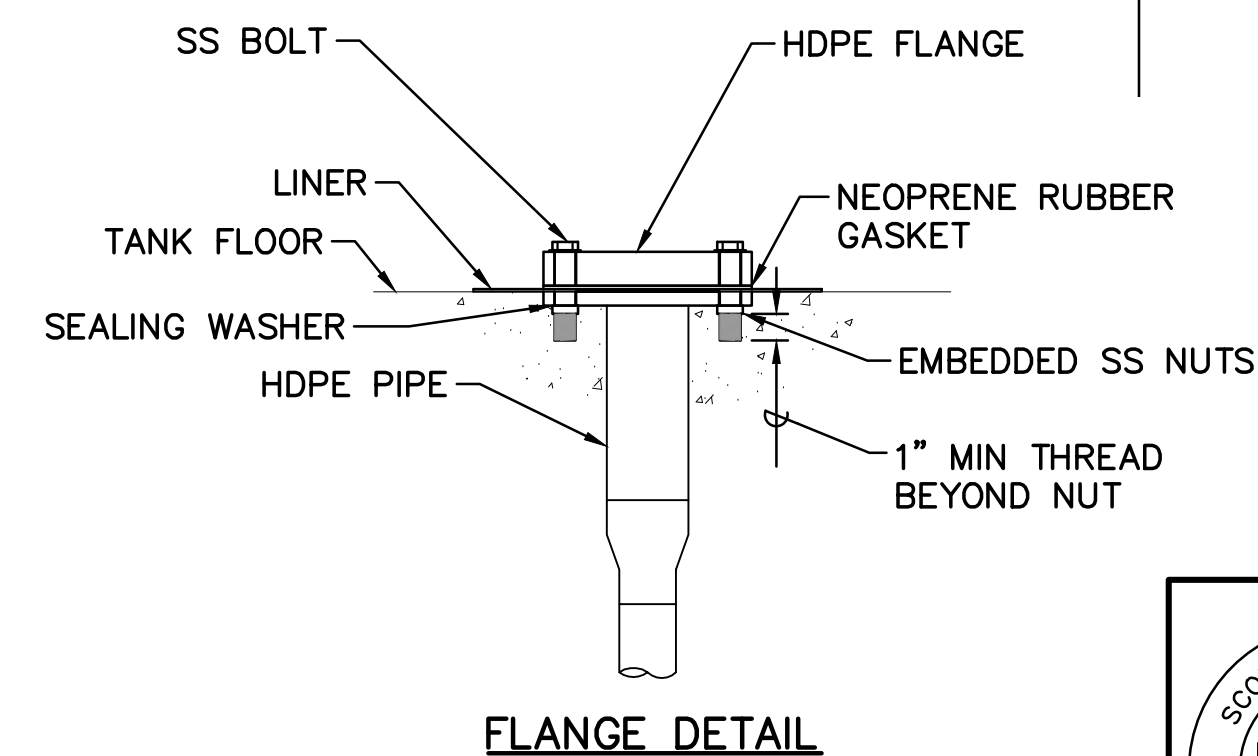
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SECTION "A"-"A"



SECTION "B"-"B"

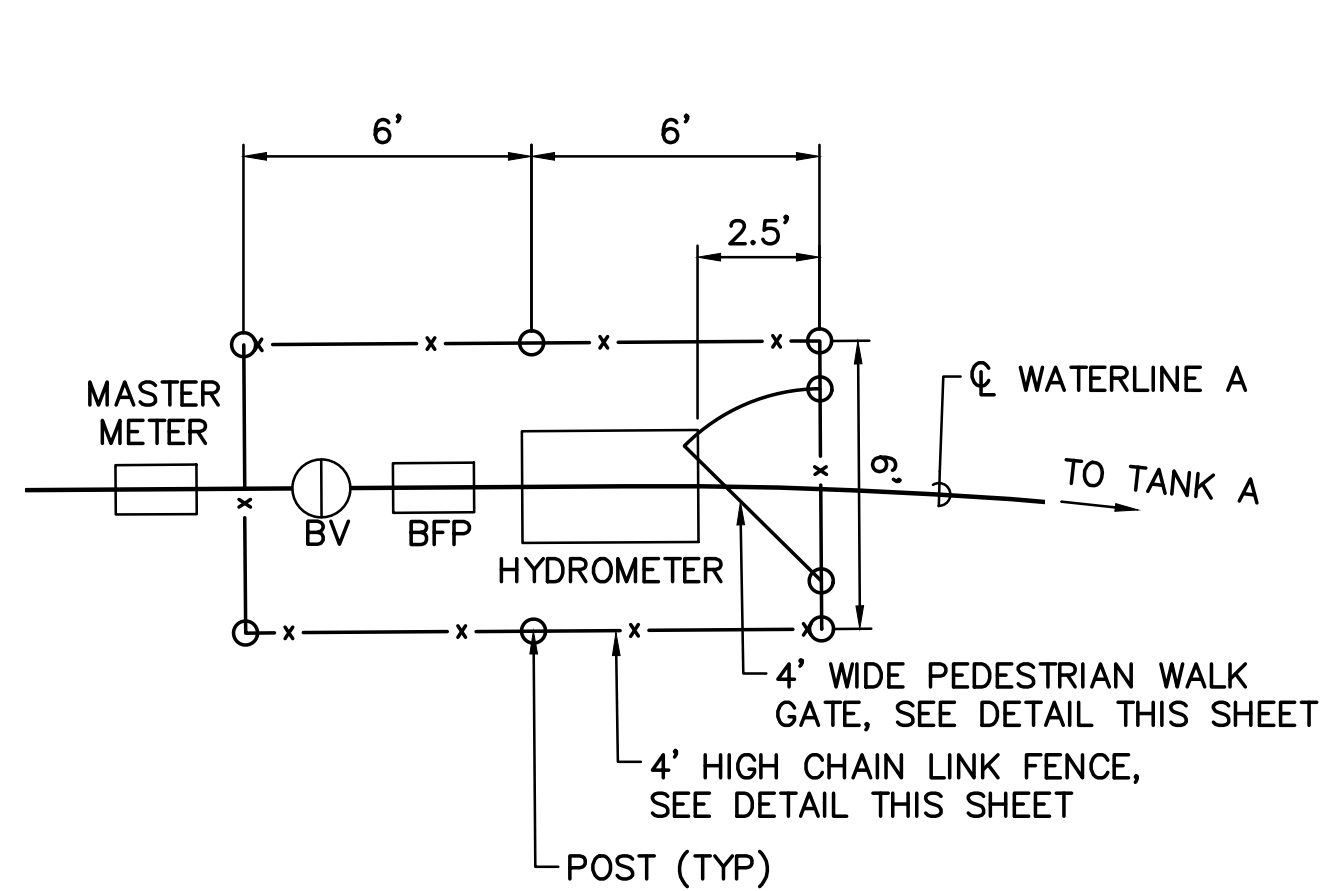


FLANGE DETAIL

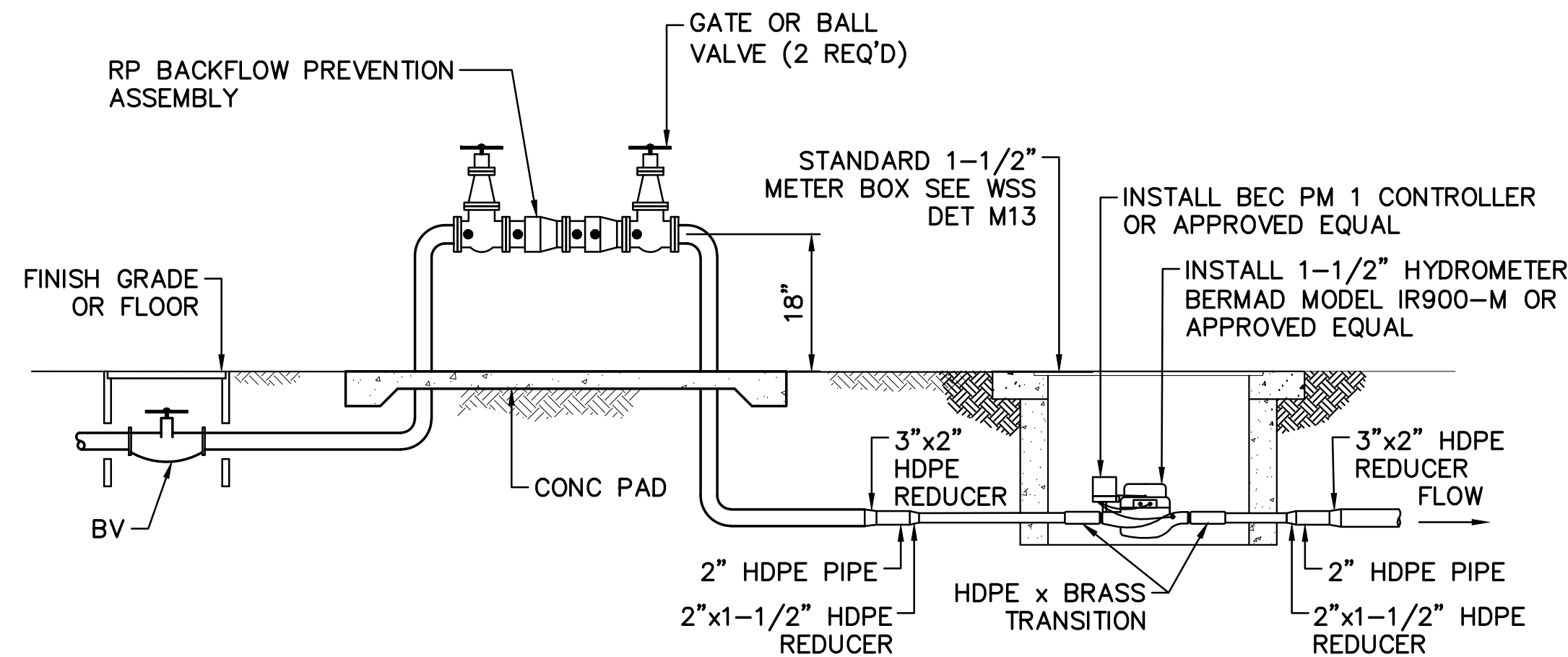


REVISION DATE	DESCRIPTION	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS HONOKAIA NON-POTABLE WATER SYSTEM TAX MAP KEY: (3) 4-6-013:002-046 HONOKAIA, HONOKAA, ISLAND OF HAWAII			
DETAILS			
Approved: _____			
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			
FILE	POCKET	FOLDER	NO.

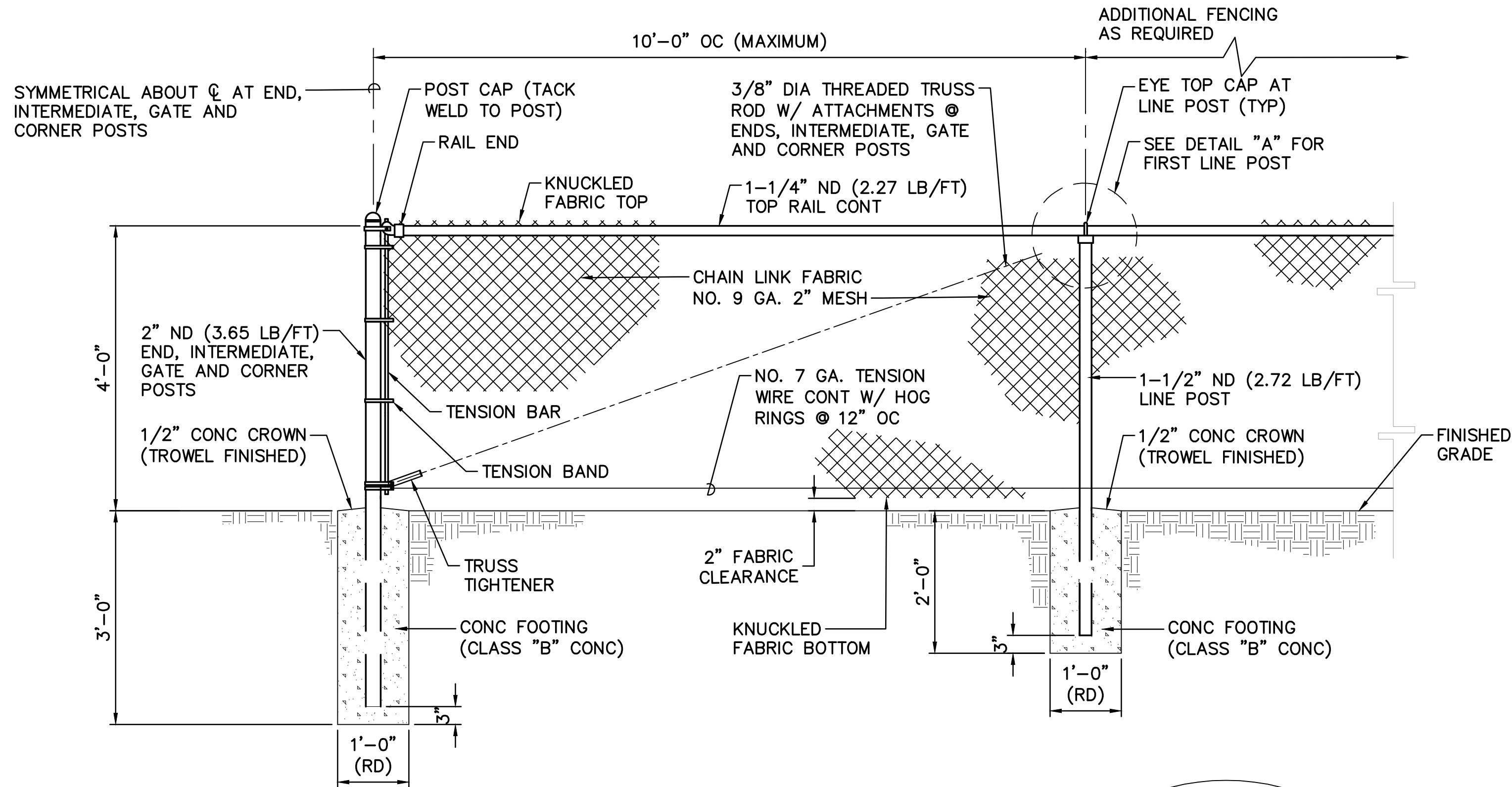
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g:\dhh11401 honokaia non-pot\300
DSGN\310 plans\DHHL1401-Details 4.dwg



PLAN
SCALE: 1" = 4'

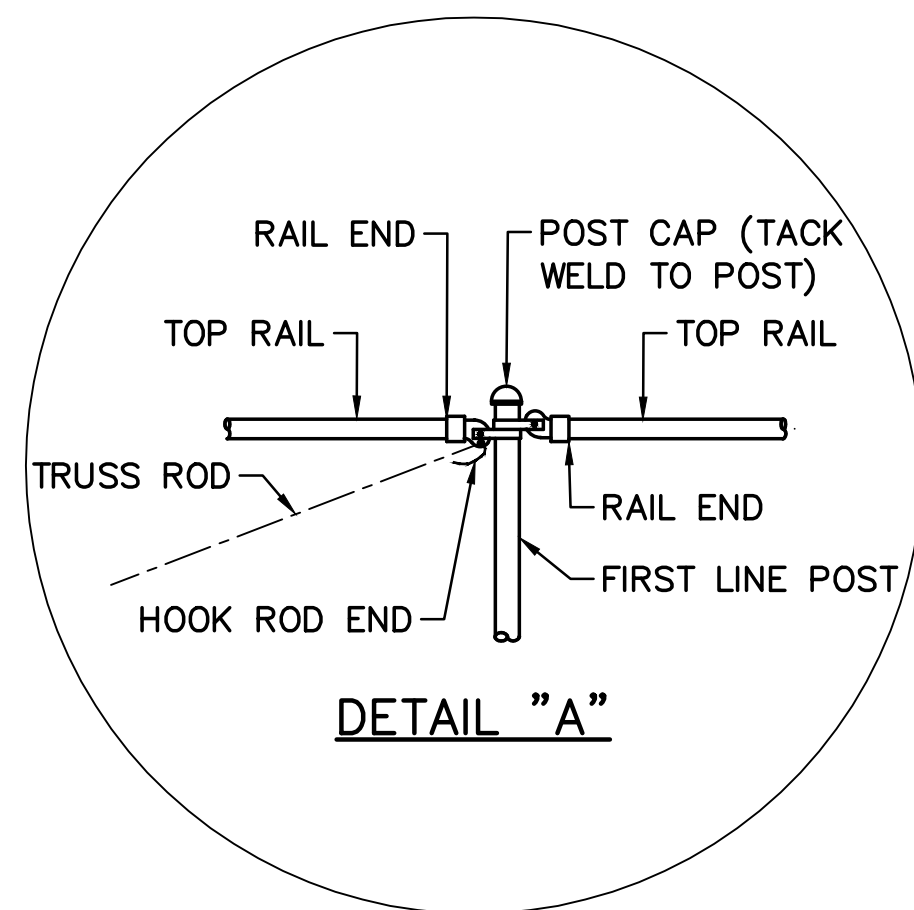


BACKFLOW PREVENTOR DETAIL
NOT TO SCALE



- NOTES:**
1. ALL PIPE AND POST SIZES ARE NOMINAL DIAMETER (ND).
 2. CHAIN LINK FABRIC, PIPES, FITTING, FASTENERS, TRUSS ROD, POSTS, HOG RINGS AND TENSION WIRE SHALL BE HOT-DIP GALVANIZED.
 3. TACK WELD CHAIN LINK FABRIC TO POST AND RAIL AT 12" OC.
 4. CHAIN LINK FABRIC SHALL BE CONTINUOUS AND FASTENED TO END, INTERMEDIATE, GATE AND CORNER POSTS BY TENSION BARS WITH TENSION BANDS EVENLY SPACED AT 15" OC (MAX).
 5. WIRE FASTENINGS SHALL BE NO 12 GAUGE GALVANIZED TIE WIRE.
 6. CHAIN LINK FABRIC SHALL BE FASTENED TO LINE POSTS WITH WIRE FASTENINGS EVENLY SPACED AT 12" OC (MAX).
 7. CHAIN LINK FABRIC SHALL BE FASTENED TO HORIZONTAL RAILS WITH WIRE FASTENINGS EVENLY SPACED AT 12" OC (MAX).
 8. ALL WIRE FASTENING ENDS SHALL BE WRAPPED AROUND CHAIN LINK A MINIMUM OF ONE COMPLETE TURN. (HOOKING OF WIRE ENDS SHALL NOT BE PERMITTED).
 9. CHAIN LINK FABRIC SHALL BE FASTENED TO A TRUSS ROD WITH NO 9 GAUGE HOG RINGS AT 12" OC.
 10. NO SPLICING SHALL BE ALLOWED ON ALL STRAIGHT-RUN PIPES.
 11. TOP AND BOTTOM SELVAGES OF CHAIN LINK FABRIC SHALL BE KNUCKLED.
 12. INSTALL INTERMEDIATE POSTS AT 200' MAX INTERVALS.
 13. ALL FIELD WELDS AND DAMAGED GALVANIZED SURFACES SHALL BE PAINTED WITH TWO COATS OF Z.R.C. COLD GALVANIZING COMPOUND.
 14. ALL FENCE POSTS SHALL BE INSTALLED EVENLY SPACED.
 15. AFTER INSTALLATION, ALL BOLT ENDS SHALL BE CUT FLUSH WITH THE NUTS AND GROUND SMOOTH.

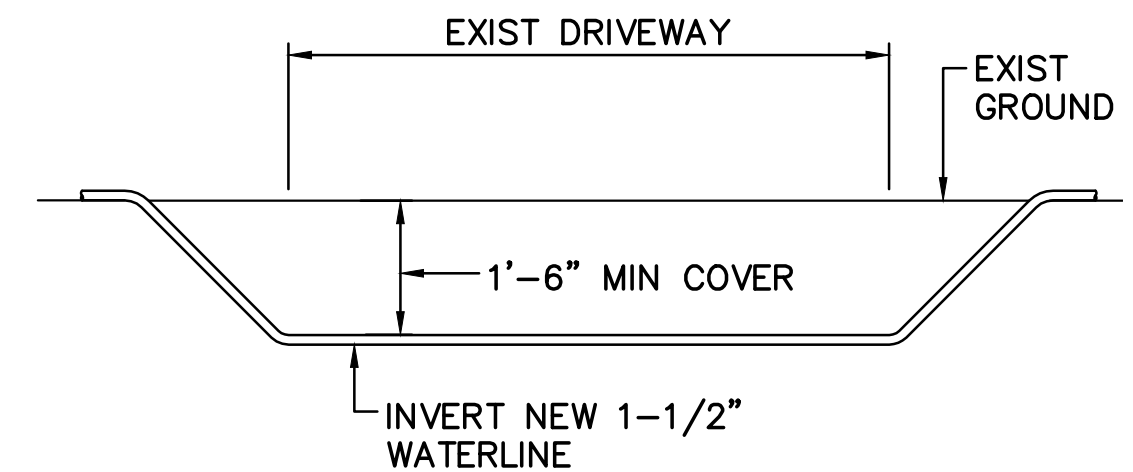
CHAIN LINK FENCE DETAIL (4'-0" HIGH)
NOT TO SCALE



1
C-24

BACKFLOW PREVENTOR ASSEMBLY WITH CHAIN LINK FENCE ENCLOSURE
SCALE AS SHOWN

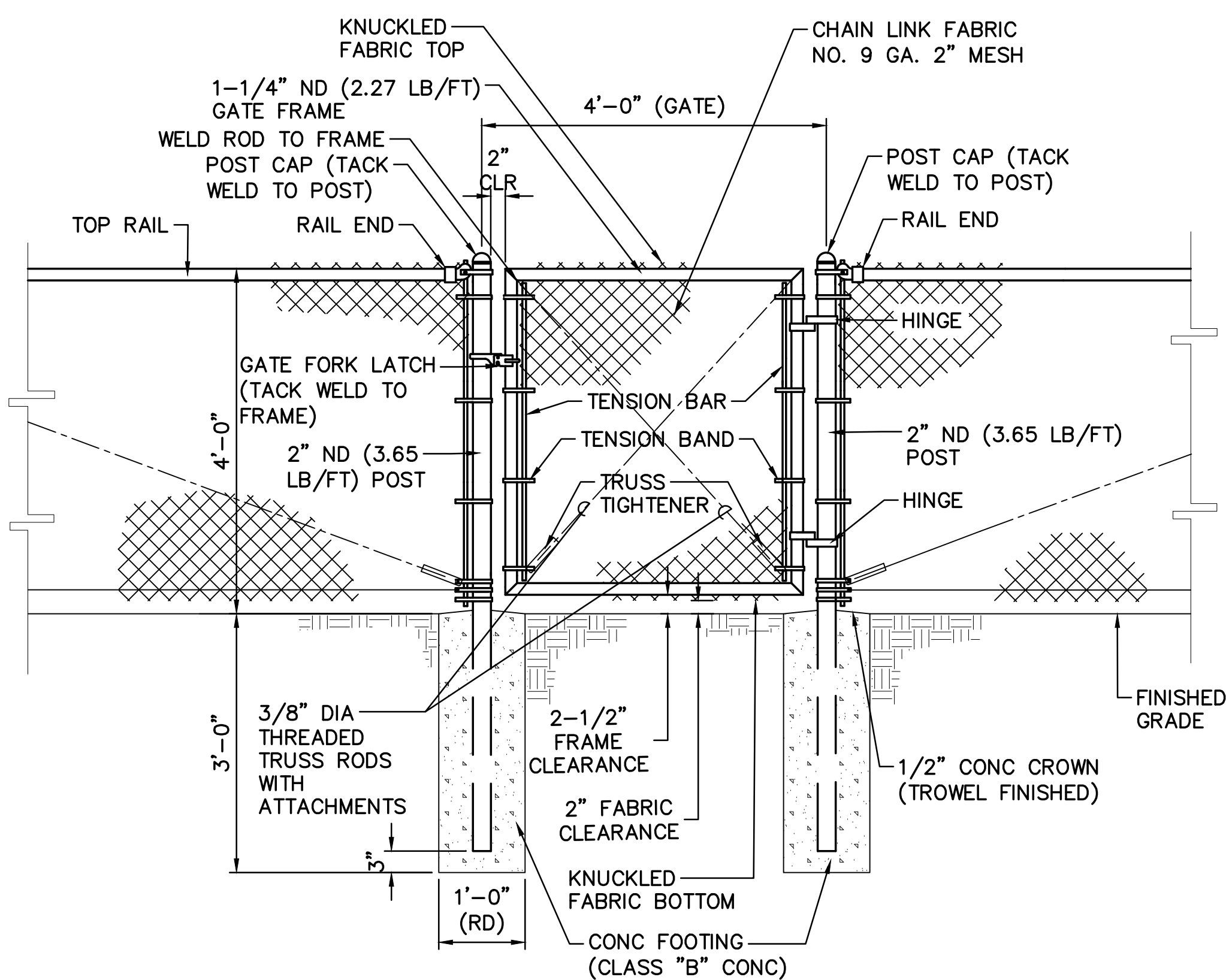
- NOTES:**
1. ANY CONNECTIONS OR TEES BETWEEN METER AND BACKFLOW PREVENTION MUST HAVE WRITTEN APPROVAL BY THE MANAGER.
 2. AT NO TIME SHALL THE BOTTOM OF THE BACKFLOW PREVENTION ASSEMBLY BE LESS THAN 12" ABOVE GROUND, FLOOR, OR FLOOD LEVEL NOR MORE THAN 48" ABOVE AFOREMENTIONED GRADES.
 3. THE BACKFLOW PREVENTION ASSEMBLY SHALL BE INSTALLED AFTER THE WATER METER PRIOR TO ANY TEES AND BRANCHES.
 4. WHENEVER BACKFLOW PREVENTION ASSEMBLY IS LOCATED 5' OR MORE FROM THE WATER METER, INSTALL CONCRETE JACKET BETWEEN WATER METER AND BACKFLOW PREVENTION ASSEMBLY TO AVOID POSSIBLE CROSS CONNECTION.
 5. THE BACKFLOW PREVENTION ASSEMBLY SHALL BE INSTALLED PRIOR TO ISSUANCE OF WATER METER OR ACTIVATION OF WATER SERVICE.
 6. REFER TO WSS DIVISION 100, SECTION 107.1 FOR ADDITIONAL REQUIREMENTS AND TYPE OF BACKFLOW PREVENTER NEEDED.



NOTE: FOR LOTS ON THE SAME SIDE OF THE WATERLINE WHERE THERE IS NO EXIST ACCESS POINT, THE WATERLINE SHALL BE BURIED A MINIMUM OF 50'. LOCATION OF BURIED PIPE TO BE DETERMINED BY THE CONTRACTOR IN THE FIELD.

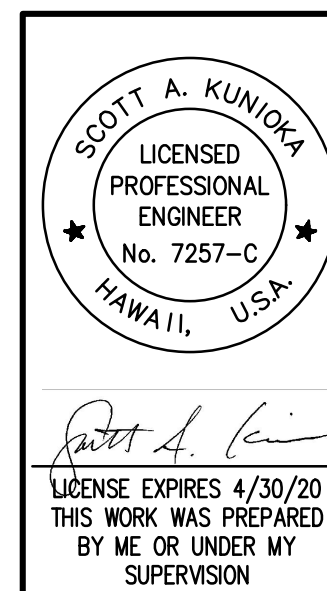
TYPICAL WATERLINE INSTALLATION AT DRIVEWAY
NOT TO SCALE

2
C-24



PEDESTRIAN WALK GATE DETAIL (4'-0" HIGH, 4'-0" WIDE)
NOT TO SCALE

- NOTES:**
1. ALL PIPE AND POST SIZES ARE NOMINAL DIAMETER (ND).
 2. GATE FRAME SHALL BE OF WELDED PIPE CONSTRUCTION. ALL WELDING SHALL CONFORM TO THE SPECIFICATIONS OF THE AMERICAN WELDING SOCIETY "STRUCTURAL WELDING CODE".
 3. FOR ALL WELDED CONNECTIONS: CORNERS SHALL BE MITERED AND ALL PIPE BRACES PROPERLY COPED.
 4. ALL WELDED CONNECTIONS SHALL BE PAINTED WITH TWO COATS OF Z.R.C. COLD GALVANIZING COMPOUND.
 5. GATE HINGES SHALL BE TACK WELDED TO GATE POSTS AND FRAMES.
 6. CHAIN LINK FABRIC, PIPES, FITTING, FASTENERS, TRUSS ROD, POSTS, HOG RINGS AND TENSION WIRE SHALL BE HOT-DIP GALVANIZED.
 7. WIRE FASTENINGS SHALL BE NO 12 GAUGE GALVANIZED TIE WIRE.
 8. CHAIN LINK FABRIC SHALL BE CONTINUOUS AND FASTENED TO SIDE FRAME PIPES BY TENSION BARS WITH TENSION BANDS EVENLY SPACED AT 15" OC (MAX).
 9. CHAIN LINK FABRIC SHALL BE FASTENED TO TOP AND BOTTOM FRAME PIPES WITH WIRE FASTENINGS EVENLY SPACED AT 12" OC (MAX).
 10. CHAIN LINK FABRIC SHALL BE FASTENED TO TRUSS RODS WITH NO 9 GAUGE HOG RINGS EVENLY SPACED AT 12" OC (MAX).
 11. TOP AND BOTTOM SELVAGES OF CHAIN LINK FABRIC SHALL BE KNUCKLED.
 12. ALL WIRE FASTENINGS SHALL BE WRAPPED AROUND CHAIN LINK A MINIMUM OF ONE COMPLETE TURN. (HOOKING OF WIRE ENDS SHALL NOT BE PERMITTED).
 13. AFTER INSTALLATION, ALL BOLT ENDS SHALL BE CUT FLUSH WITH THE NUTS AND GROUND SMOOTH.
 14. THE CONTRACTOR SHALL PROVIDE TWO PADLOCKS TO SECURE THE ENCLOSURE. THE PADLOCKS SHALL BE KEYED ALIKE.



REVISION DATE	DESCRIPTION	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS HONOKAIA NON-POTABLE WATER SYSTEM TAX MAP KEY: (3) 4-6-013.002-046 HONOKAIA, HONOKAA, ISLAND OF HAWAII			
DETAILS			
Approved:			
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			

4' 0 4' 8'
SCALE: 1" = 4'-0"

TANK STRUCTURAL GENERAL NOTES:

I. DESIGN REFERENCES

- ACI 318–06 CODE REQUIREMENTS FOR BUILDING STRUCTURES
- ACI 350–06 CODE REQUIREMENTS FOR ENVIRONMENTAL ENGINEERING CONCRETE STRUCTURES.
- ACI 350.03–06 SEISMIC DESIGN OF LIQUID–CONTAINING CONCRETE STRUCTURES.
- AWWA D103–09 FACTORY–COATED BOLTED CARBON STEEL TANKS FOR WATER STORAGE

II. DESIGN LOADS

- ROOF LOAD-----20 PSF LIVE LOAD
- LIQUID (WATER)-----62.5 PCF
- SOIL BEARING CAPACITY-----4,000 PSF GROSS
- SEISMIC DESIGN PARAMETERS
 - SPECTRAL RESPONSE ACCELERATION (5% DAMPING)
 $S_S = 1.278g$
 $S_H = 0.477g$
 - SITE CLASS-----C
 - DESIGN SPECTRAL RESPONSE ACCELERATION
 $S_{DS} = 0.852g$
 $S_{D1} = 0.420g$
 - IMPORTANCE FACTOR-----1.00 (AWWA D103–09)
 - RESPONSE MODIFICATION FACTOR (AWWA D110–13)
 $R_H = 3.0$ (MECHANICALLY ANCHORED)
 $R_C = 1.5$ (MECHANICALLY ANCHORED)

III. FOUNDATION NOTES

- FOUNDATION DESIGN IS BASED ON GEOTECHNICAL INVESTIGATION REPORT PREPARED BY GEOLABS, INC. (W.O. 7053–00), DATED FEBRUARY 25, 2015.
- CONTRACTOR SHALL PROVIDE DE–WATERING OF EXCAVATED AREAS, AS REQUIRED.
- CONTRACTOR SHALL PROVIDE DESIGN AND INSTALLATION OF ALL CRIBBING, SHEETING, AND SHORING NECESSARY TO PRESERVE EXCAVATIONS AND EARTH BANKS. SHORING SHALL CONFORM TO OSHA REGULATIONS.
- VOLCANIC ASH SOILS ON LOT 4 (LOWER TANK SITE) SHALL BE REMOVED DOWN TO BASALT FORMATION (APPROXIMATELY 3.5 TO 4 FEET THICK). AND REPLACED WITH STRUCTURAL COMPACTED FILL. THE REMOVAL AND REPLACEMENT SHALL EXTEND A LATERAL DISTANCE OF 3 FEET BEYOND THE TANK FOUNDATION PERIMETER.
- AT LOT 5 (UPPER TANK SITE) OVER–EXCAVATE THE EXISTING FILL MATERIALS A MINIMUM DEPTH OF 3 FEET BELOW THE WATER TANK FOUNDATION AND REPLACE WITH COMPACTED STRUCTURAL FILL. THE OVER–EXCAVATION AND REPLACEMENT SHALL EXTEND A LATERAL DISTANCE OF 3 FEET BEYOND THE TANK FOUNDATION PERIMETER.
- STRUCTURAL FILL MATERIAL SHALL CONSIST OF WELL–GRADED MATERIAL LESS THAN 6–INCHES IN MAXIMUM SIZE WITH SUFFICIENT FINES TO PREVENT THE OCCURANCE OF VOIDS IN THE COMPACTED FILL. THE EXISTING FILL MATERIAL AT THE UPPER TANK SITE CAN BE REUSED AS STRUCTURAL FILL MATERIAL IF ALL MATERIAL LARGER THAN 6–INCHES AND ALL VEGETATION, DELETERIOUS MATERIALS ARE REMOVED PRIOR TO BEING USED. FOR CONFINED LOCATIONS (WHERE COMPACTION EQUIPMENT IS LIMITED IN SIZE TO LESS THAN 2 TONS IN STATIC WEIGHT), THE MAXIMUM SIZE FILL MATERIAL SHALL BE 3–INCHES IN DIMENSION.
- EXCAVATIONS FOR FOOTINGS SHALL BE APPROVED BY THE LICENSED GEOTECHNICAL ENGINEER IN STATE OF HAWAII (PROVIDED BY CONTRACTOR) PRIOR TO PLACEMENT OF CONCRETE AND REINFORCING. SOFT AND/OR LOOSE MATERIAL ENCOUNTERED AT THE BOTTOM OF THE FOOTING EXCAVATIONS SHALL BE OVER–EXCAVATED DOWN TO DENSE MATERIAL. THE AREA SHALL BE FILLED WITH COMPACTED STRUCTURAL FILL OR THE FOOTING EXCAVATION CAN BE EXTENDED DOWN TO BEAR DIRECTLY ON THE UNDERLYING COMPETENT MATERIAL.
- STRUCTURAL FILL SHOULD BE MOISTURE CONDITIONED TO WITHIN TWO PERCENT OF THE OPTIMUM MOISTURE CONTENT AND PLACED IN HORIZONTAL LIFTS NOT TO EXCEED TWELVE (12) INCHES IN LOOSE FILL MATERIAL. FILL SHALL BE COMPACTED TO MINIMUM 95% RELATIVE COMPACTION AS MEASURED BY ASTM D1557, METHOD A OR D.

IV. CONCRETE NOTES:

- CONCRETE CONSTRUCTION SHALL CONFORM TO AMERICAN CONCRETE INSTITUTE ACI 318–06.
- CONCRETE SHALL BE NORMAL WEIGHT HARD ROCK CONCRETE AND SHALL HAVE THE FOLLOWING MINIMUM 28 DAY COMPRESSIVE STRENGTHS:
 - FOUNDATION AND TANK FLOOR SLAB-----4000 PSI
 - ALL OTHER CONCRETE-----3000 PSI
- THE MAXIMUM WATER–CEMENT RATIO (BY WEIGHT) FOR FOUNDATION CONCRETE SHALL BE 0.48 WITH A MINIMUM OF 6 SACKS PER CUBIC YEARD OF CEMENTITIOUS MATERIAL AND A MAXIMUM AGGREGATE SIZE OF 1–INCH AND MINIMUM SIZE 57 PER ASTM C33.
- CONCRETE DELIVERY TICKETS SHALL RECORD ALL FREE WATER IN THE MIX AT BATCHING PLANT, ADDED FOR CONSISTENCY BY DRIVER, AND ANY ADDITIONAL REQUEST BY CONTRACTOR UP TO THE MAXIMUM AMOUNT ALLOWED BY THE MIX DESIGN.
- ALL INSERTS, ANCHOR BOLTS, PLATES, AND OTHER ITEMS TO BE CAST IN THE CONCRETE SHALL BE HOT–DIPPED GALVANIZED ACCORDING TO ASTM A153 UNLESS OTHERWISE NOTED.
- REINFORCING BARS, ANCHOR BOLTS, INSERTS, AND OTHER ITEMS TO BE CAST IN THE CONCRETE SHALL BE SECURED IN POSITION PRIOR TO PLACEMENT OF CONCRETE.
- CONDUITS AND PIPES PASSING THROUGH A SLAB OR FOOTING THAT DO NOT CONFORM TO TYPICAL DETAILS SHALL BE LOCATED AND THE PROPOSED CONSTRUCTION DETAIL SUBMITTED TO THE ENGINEER FOR APPROVAL.
- SEE TANK MANUFACTURER'S DRAWINGS FOR CHAMFERS, EDGE RADII, FINISHES AND OTHER NON–STRUCTURAL ITEMS NOT SHOWN OR SPECIFIED ON THE STRUCTURAL DRAWINGS.

V. REINFORCING STEEL:

- ALL REINFORCING STEEL SHALL BE DEFORMED BARS CONFORMING TO ASTM A615 GRADE 60.
- CLEAR CONCRETE COVER FOR REINFORCING BARS SHALL BE AS FOLLOWS, UNLESS OTHERWISE NOTED:
 - FOOTING, CONCRETE JACKET, ETC. CAST AGAINST EARTH ----- 3"
 - FOOTING, CONCRETE JACKET, ETC. FORMED AND EXPOSED TO EARTH OR WEATHER ----- 2"
- ALL REINFORCING STEEL, ANCHOR BOLTS, DOWELS, AND OTHER INSERTS AND EMBEDS SHALL BE SECURED IN POSITION, INSPECTED AND APPROVED PRIOR TO PLACING CONCRETE.
- REINFORCING BARS SHALL NOT BE IN CONTACT WITH ANY PIPE, PIPE FLANGE OR METAL PARTS EMBEDDED IN CONCRETE, A MINIMUM OF 2 INCH CLEARANCE SHALL BE PROVIDED AT ALL TIMES, UNO.

VI. SPECIAL INSPECTION

- SPECIAL INSPECTIONS ARE REQUIRED FOR THIS PROJECT AND SHALL BE PERFORMED IN ACCORDANCE WITH IBC CHAPTER 17. SPECIAL INSPECTIONS SHALL BE PERFORMED BY A REGISTERED DEPUTY INSPECTOR EMPLOYED BY THE OWNER IN THESE CATEGORIES:
CONCRETE PLACEMENT – CONCRETE ANCHORS – REINFORCING STEEL PLACEMENT – GRADING, EXCAVATION

IX. STRUCTURAL OBSERVATION

- ENGINEER SHALL PERFORM STRUCTURAL OBSERVATION AS REQUIRED BY IBC CHAPTER 17 SECTION 1709, AND AS DEFINED BY SECTION 220. STRUCTURAL OBSERVATION SHALL BE PROVIDED DURING THE STAGES OF CONSTRUCTION LISTED BELOW. IT SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE AT LEAST 72 HOURS ADVANCE NOTICE TO THE DESIGN ENGINEER WHEN HIS WORK IS READY FOR STRUCTURAL OBSERVATION FOR EACH OF THESE STAGES:
REINFORCING PLACEMENT FOR FLOOR AND TANK FOOTING

ABBREVIATION LEGEND

ACI	– AMERICAN CONCRETE INSTITUTE	HORIZ	– HORIZONTAL
ANSI	– AMERICAN NATIONAL STANDARD INSTITUTE	IBC	– INTERNATIONAL BUILDING CODE
ASTM	– AMERICAN SOCIETY FOR TESTING AND MATERIALS	KSI	– KIP PER SQUARE INCH
AWS	– AMERICAN WELDING SOCIETY	LP	– LOW POINT
AWWA	– AMERICAN WATER WORKS ASSOCIATION	MANUF.	– MANUFACTURER
¢	– CENTERLINE	MAX	– MAXIMUM
CLR	– CLEAR	MIN	– MINIMUM
CONC	– CONCRETE	NO	– NUMBER
CONT	– CONTINUOUS	NOM	– NOMINAL
DIA/ø	– DIAMETER	OC	– ON CENTER
DIAG	– DIAGONAL	PCF	– POUNDS PER CUBIC FOOT
DWGS	– DRAWINGS	PSF	– POUNDS PER SQUARE FOOT
EA	– EACH	PSI	– POUNDS PER SQUARE INCH
EF	– EACH FACE	REINF	– REINFORCEMENT
ELEV	– ELEVATION	SCH	– SCHEDULE
EW	– EACH WAY	SECT	– SECTION
FF	– FINISHED FLOOR	SS/SST	– STAINLESS STEEL
FG	– FINISHED GRADE	STD	– STANDARD
FTG	– FOOTING	SYMM	– SYMMETRICAL
GA	– GAUGE	UNO	– UNLESS NOTED OTHERWISE
GALV	– GALVANIZED	VERT	– VERTICAL
HDPE	– HIGH DENSITY POLYETHYLENE	W/	– WITH

MINIMUM SPLICE AND DEVELOPMENT LENGTHS										
BAR SIZE	CONCRETE STRENGTH = 3,000 PSI					CONCRETE STRENGTH = 4,000 PSI				
	LAP SPLICE		DEVELOPMENT			LAP SPLICE		DEVELOPMENT		
	TOP BARS	OTHER BARS	STRAIGHT		WITH STANDARD HOOK	TOP BARS	OTHER BARS	STRAIGHT		WITH STANDARD HOOK
			TOP BARS	OTHER BARS				TOP BARS	OTHER BARS	
#3	28"	22"	22"	18"	10"	26"	20"	20"	16"	8"
#4	38"	30"	30"	22"	12"	34"	26"	26"	20"	10"
#5	48"	36"	36"	28"	14"	42"	32"	32"	24"	12"
#6	56"	44"	44"	34"	18"	50"	38"	38"	30"	16"
#7	82"	64"	64"	48"	20"	72"	54"	54"	42"	18"
#8	94"	72"	72"	56"	22"	82"	62"	62"	48"	20"
#9	106"	82"	82"	62"	26"	92"	70"	70"	54"	22"
#10	118"	92"	92"	70"	28"	102"	80"	80"	62"	26"
#11	132"	102"	102"	78"	32"	114"	88"	88"	68"	28"

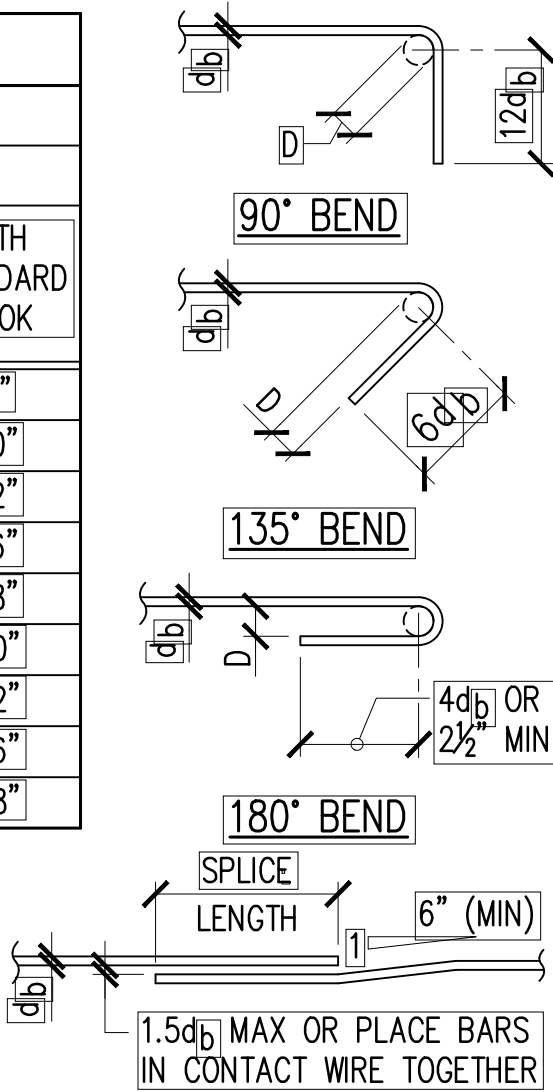
NOTES:

- LENGTHS ARE FOR CONCRETE WITH REBAR SPACED AT 6 BAR DIAMETERS MINIMUM. INCREASE LENGTHS BY 25% FOR BARS SPACED LESS THAN 6 BAR DIAMETERS.
- "TOP BARS" ARE HORIZONTAL BARS WITH 12" OR MORE OF CONCRETE CAST BELOW.

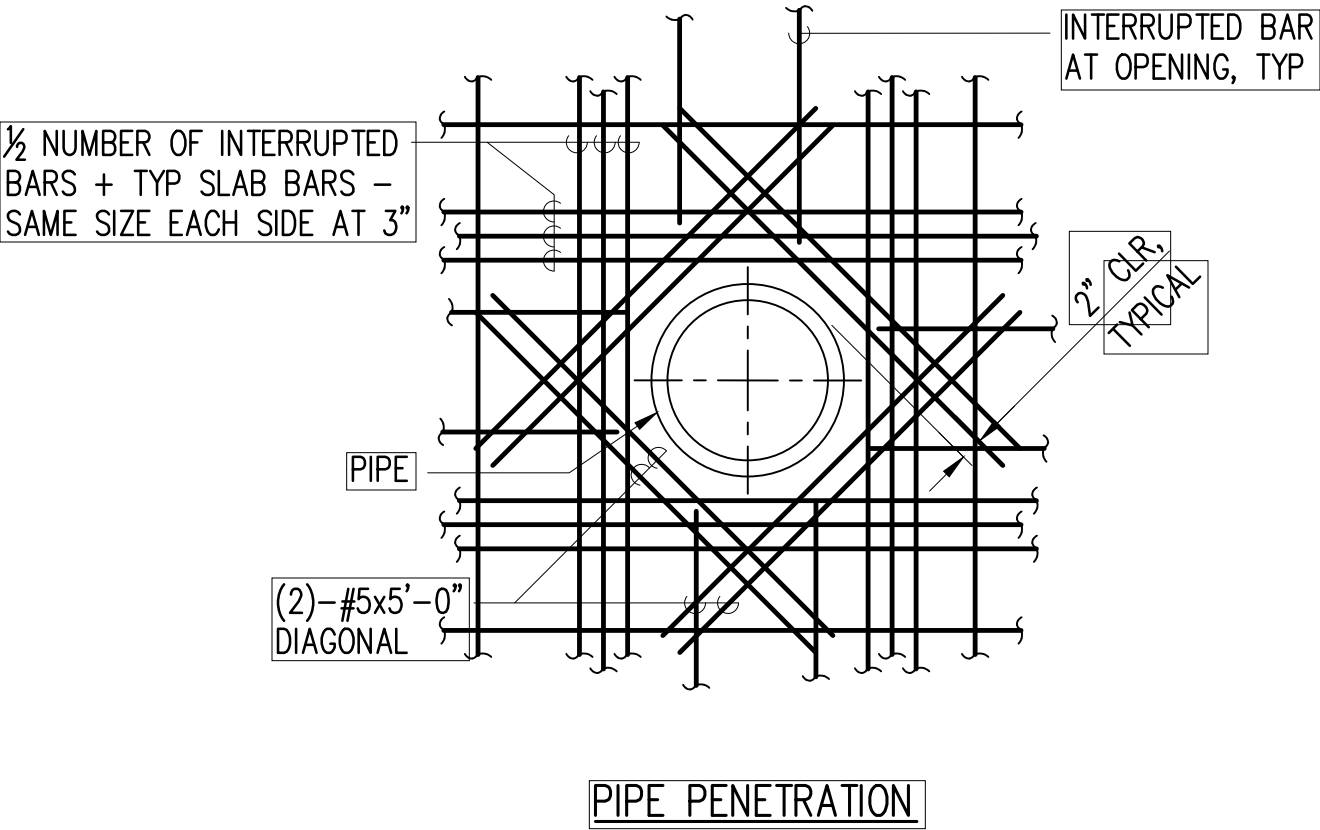
TYPICAL REBAR SPLICE AND DEVELOPMENT LENGTH SCHEDULE

1
S–1

NOT TO SCALE



D = 6d_b FOR #8 AND SMALLER
D = 8d_b FOR #9 TO #11

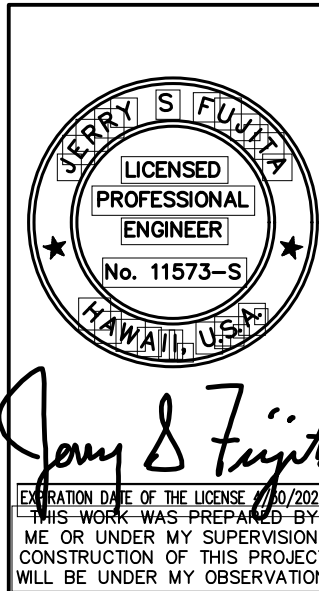


NOTES:
BEND REINFORCEMENT WHERE REQUIRED AT SLAB EDGE.

2
S–1

TYP ADDED REINFORCING AT FLOOR OPENING

SCALE: 3/4" = 1'–0"

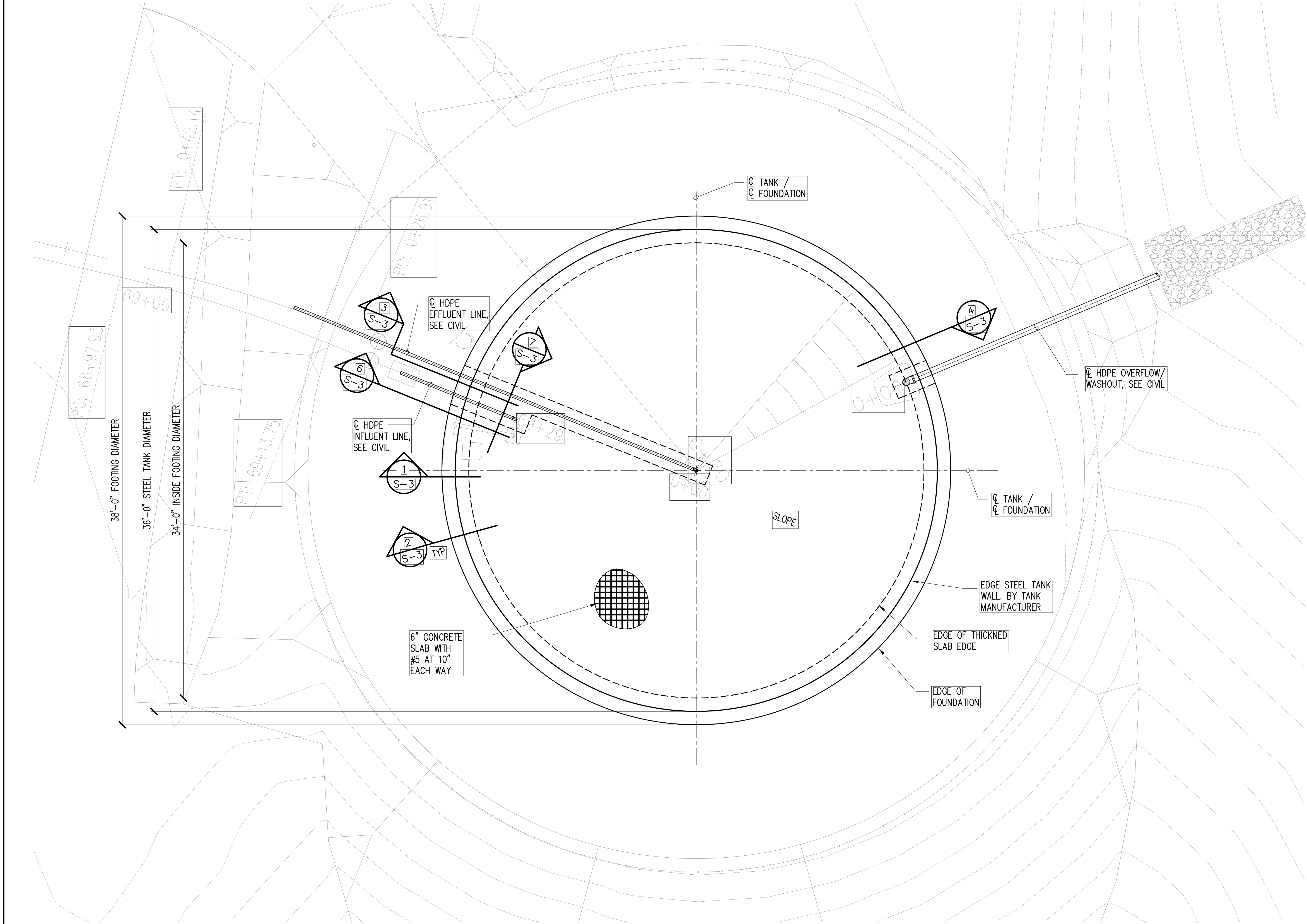


REVISION DATE	DESCRIPTION	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS HONOKAI'A NON–POTABLE WATER SYSTEM TAX MAP KEY: (3) 4–6–013:002–046 HONOKAI'A, HONOKAA, ISLAND OF HAWAII			
TANK STRUCTURAL GENERAL NOTES, ABBREVIATIONS, AND TYPICAL DETAILS			
Approved: _____ COUNTY ENGINEER, DPW, COUNTY OF HAWAII			
[DATE]			
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			

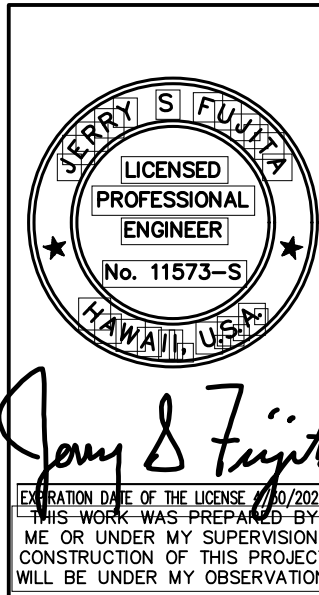
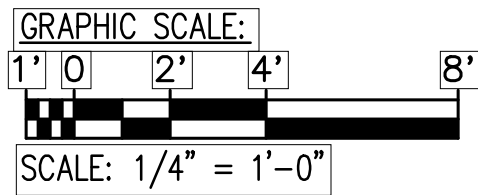
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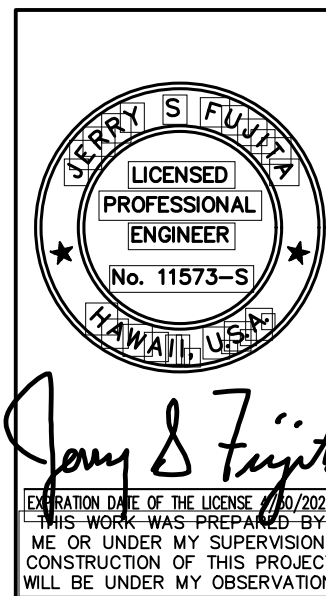
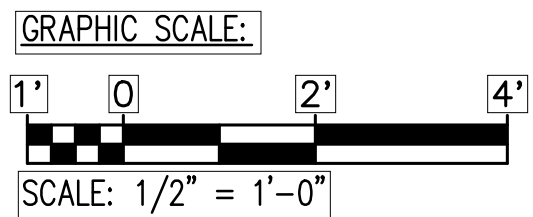
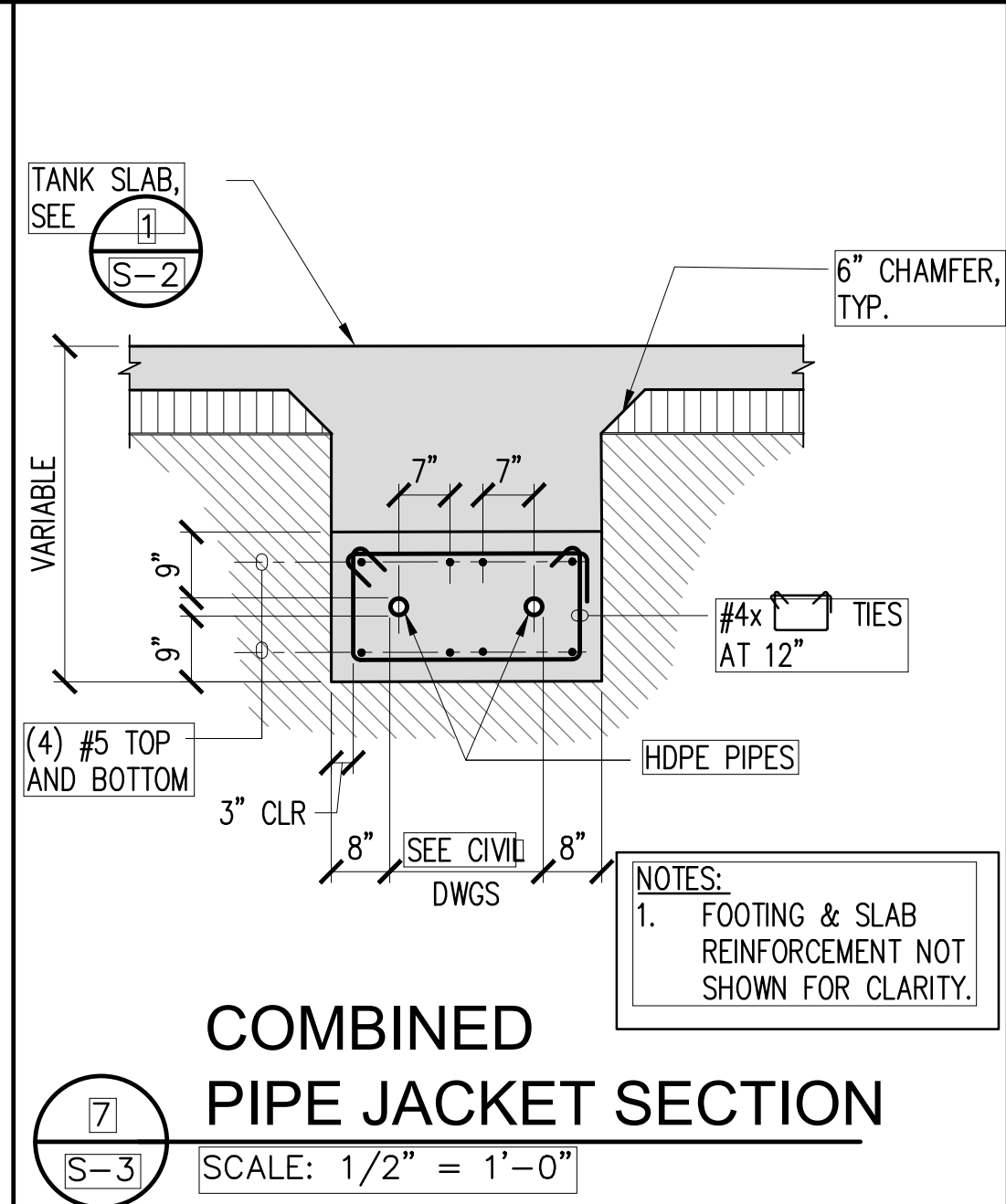
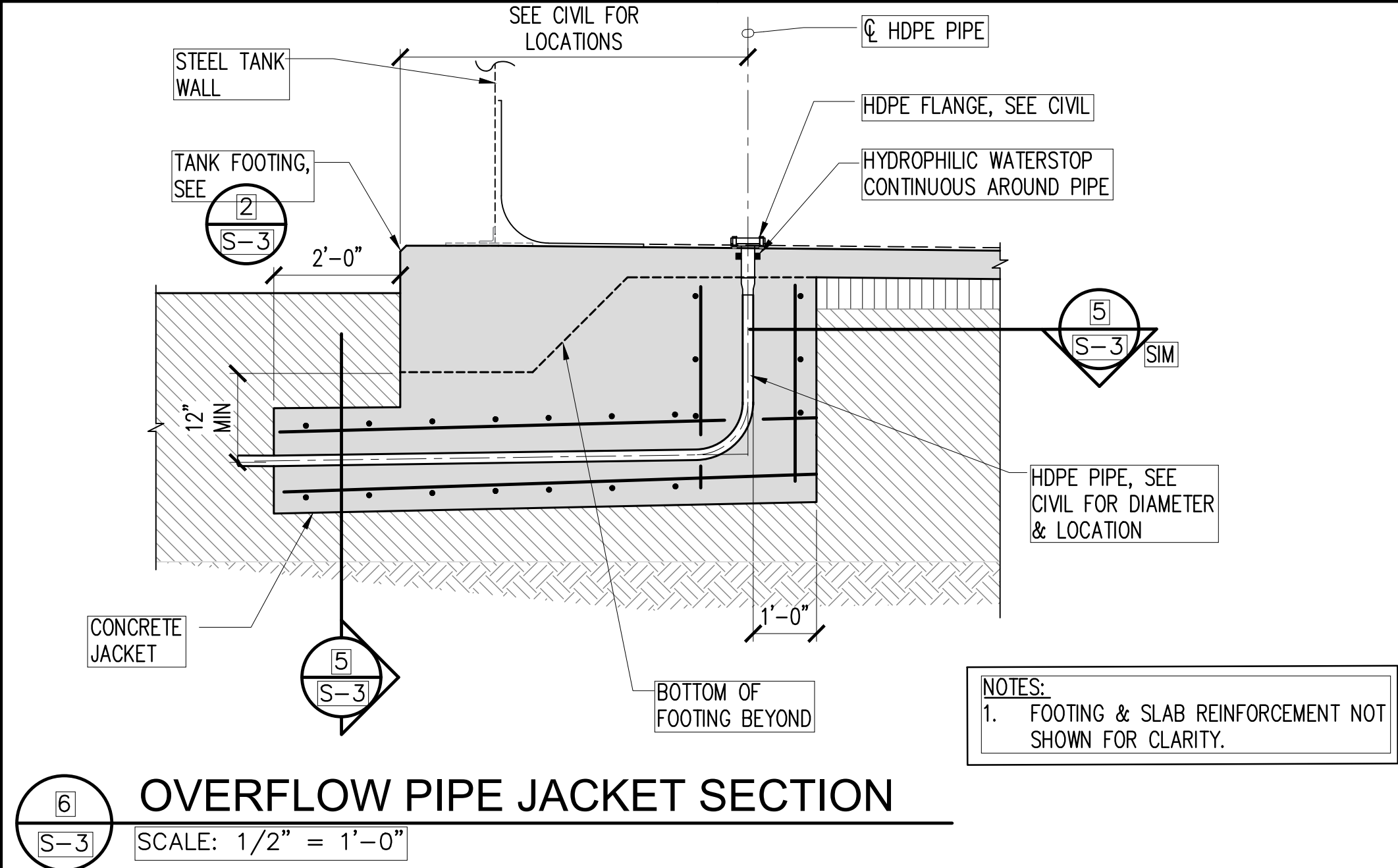
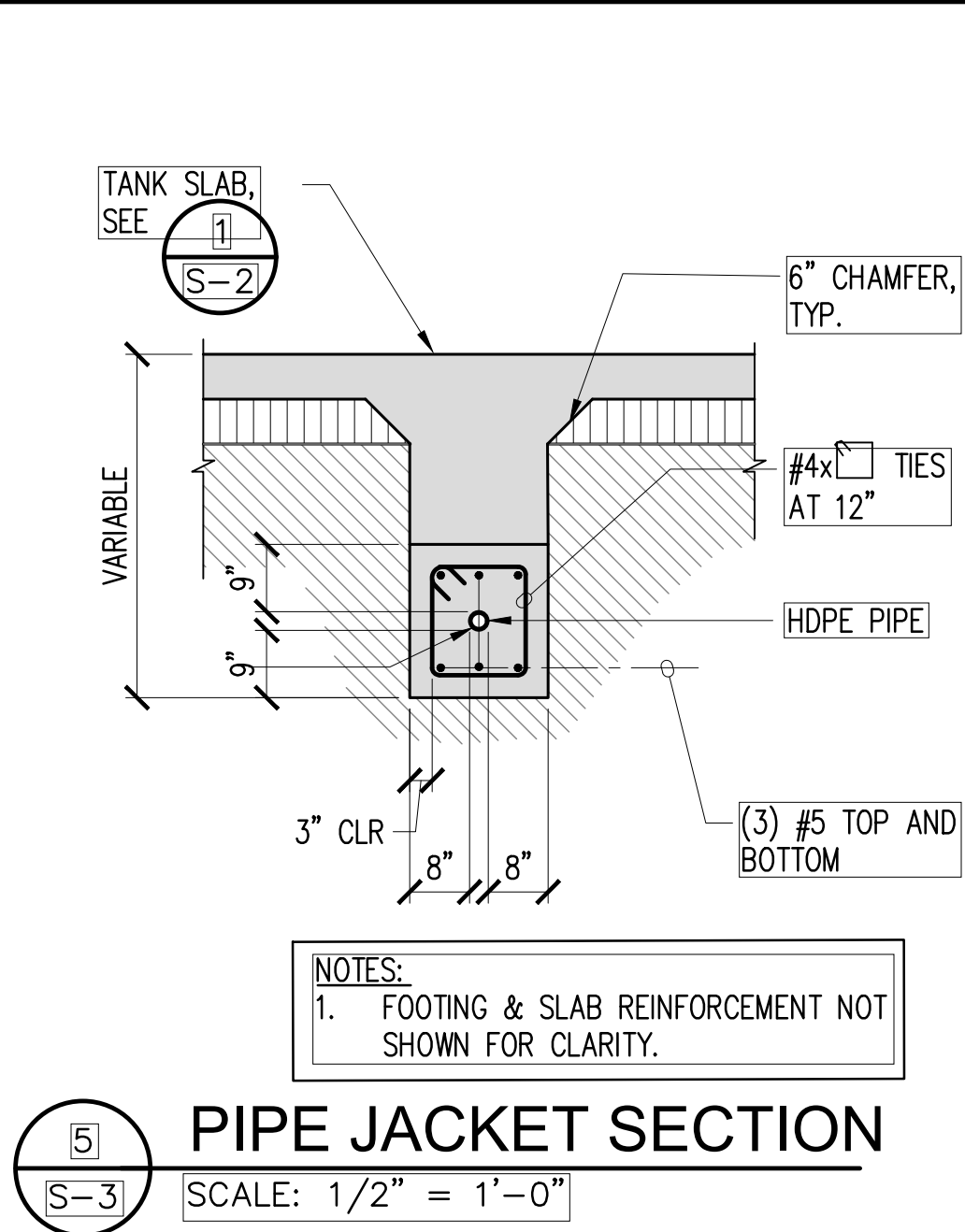
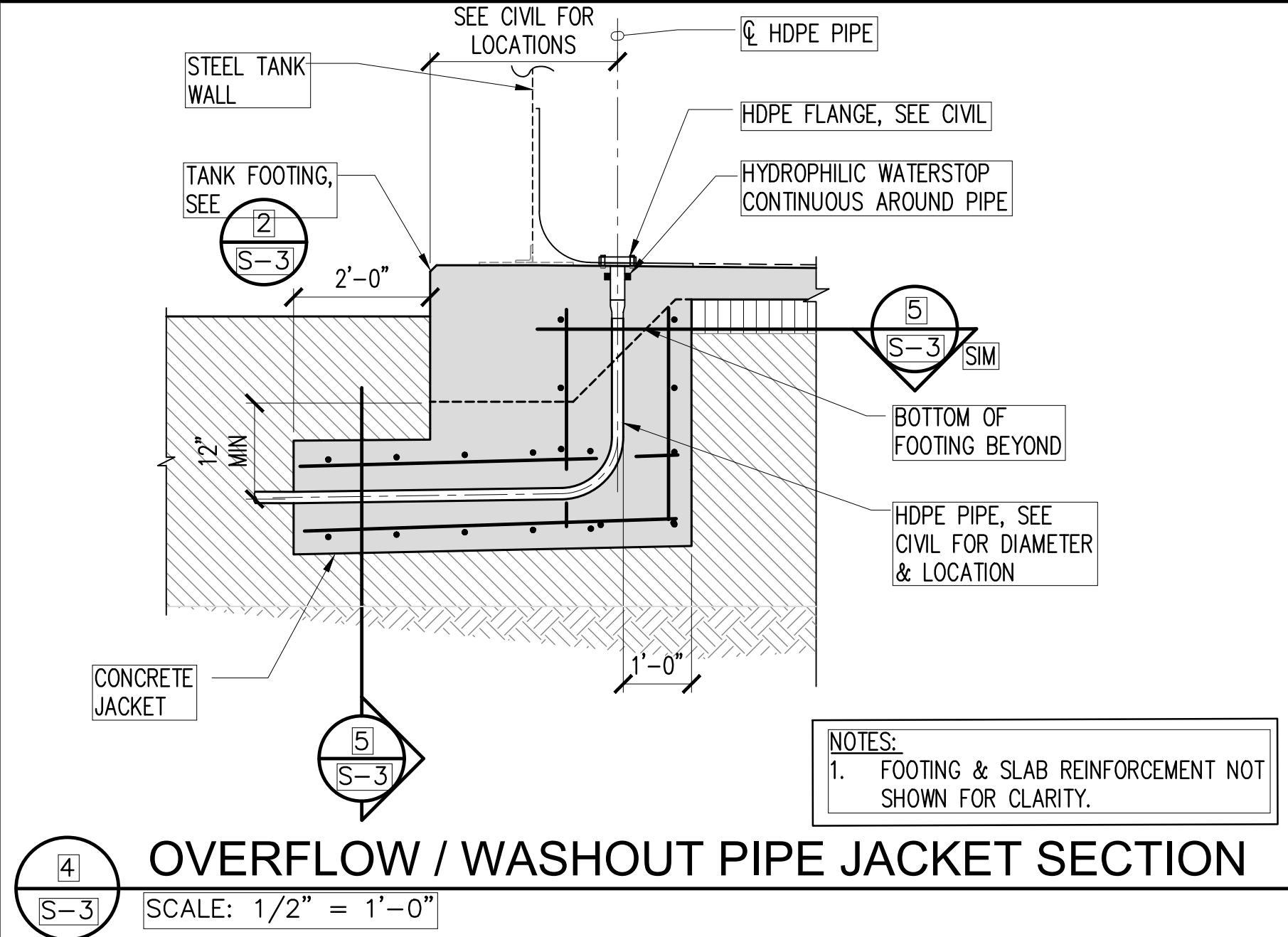
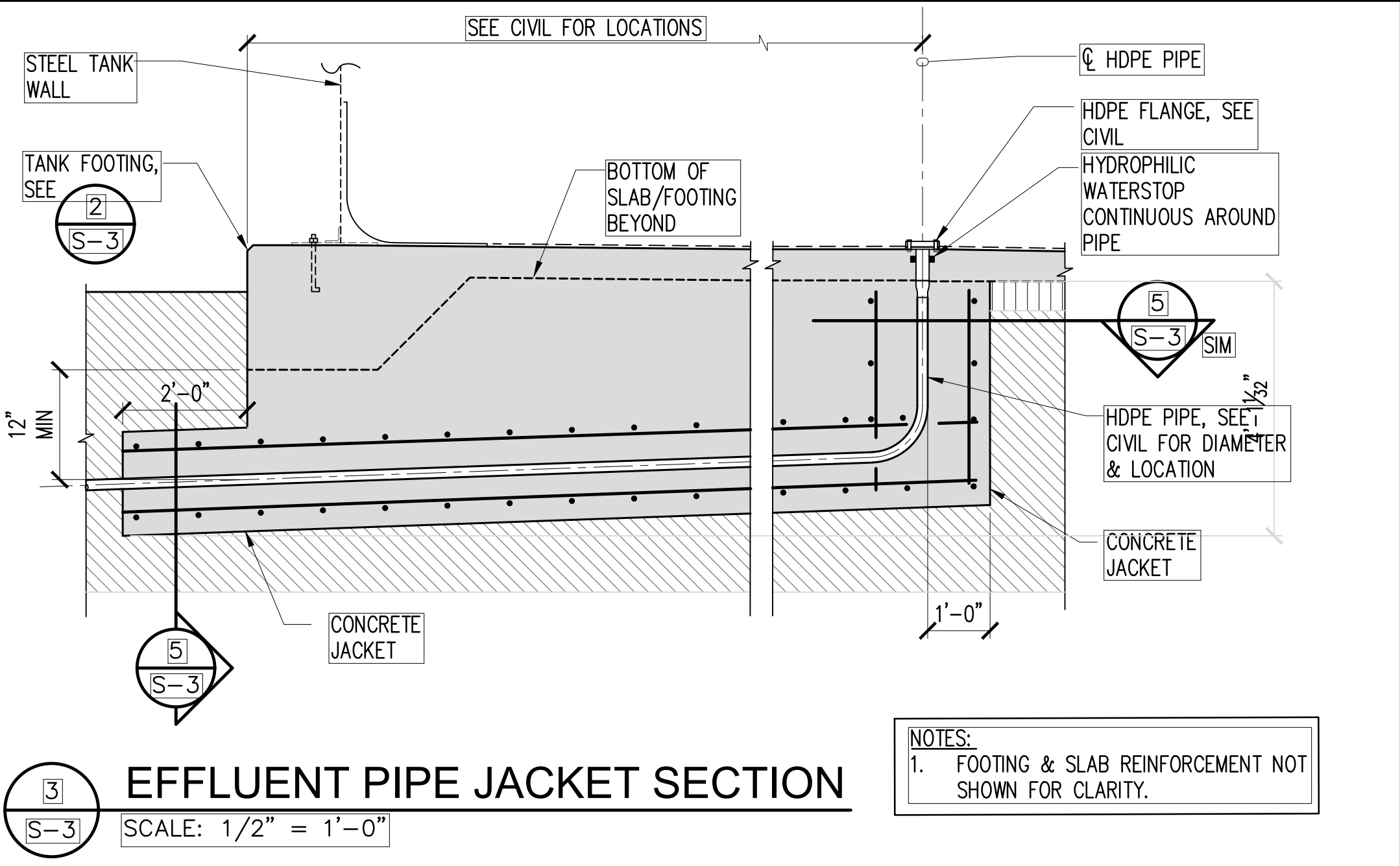
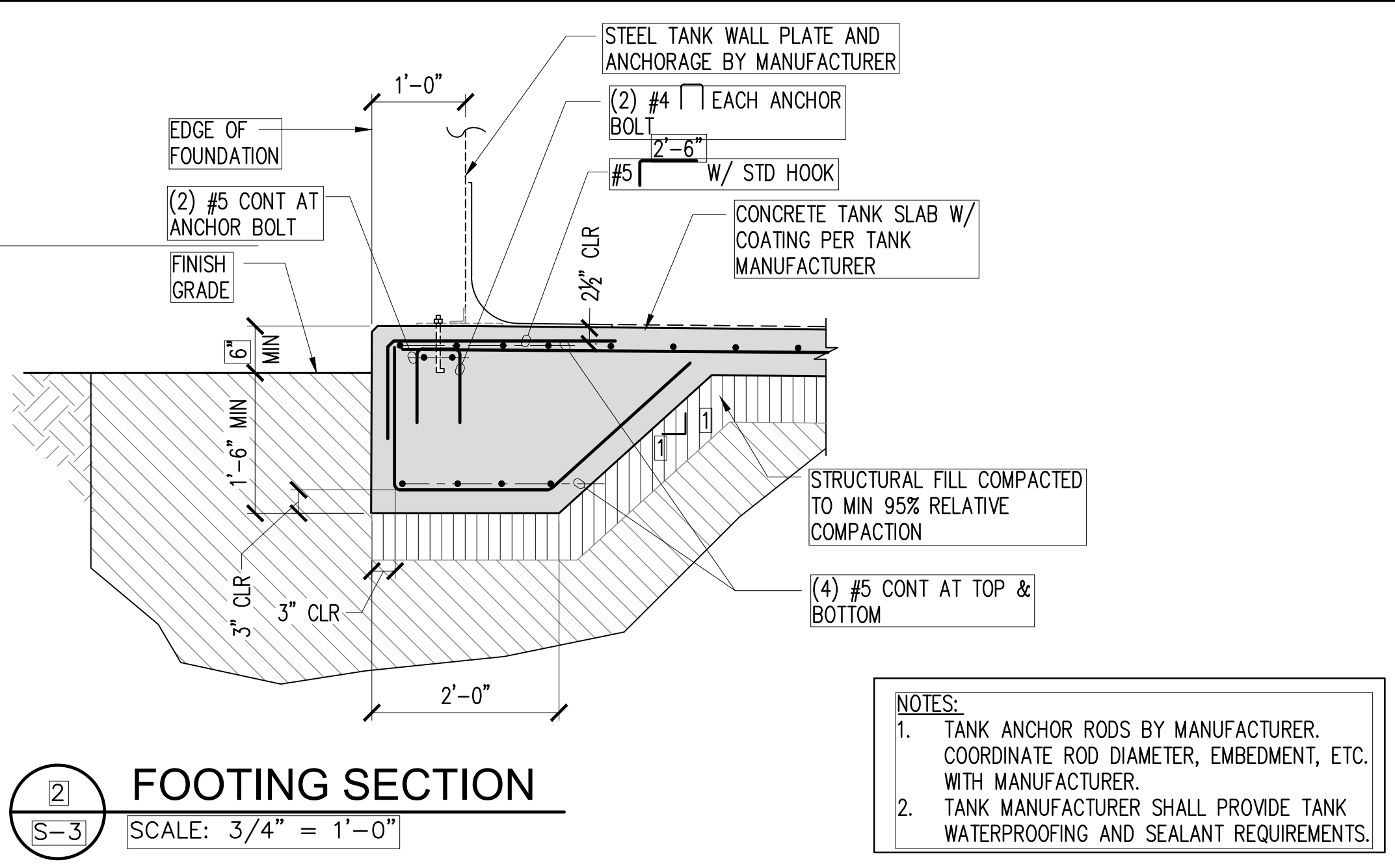
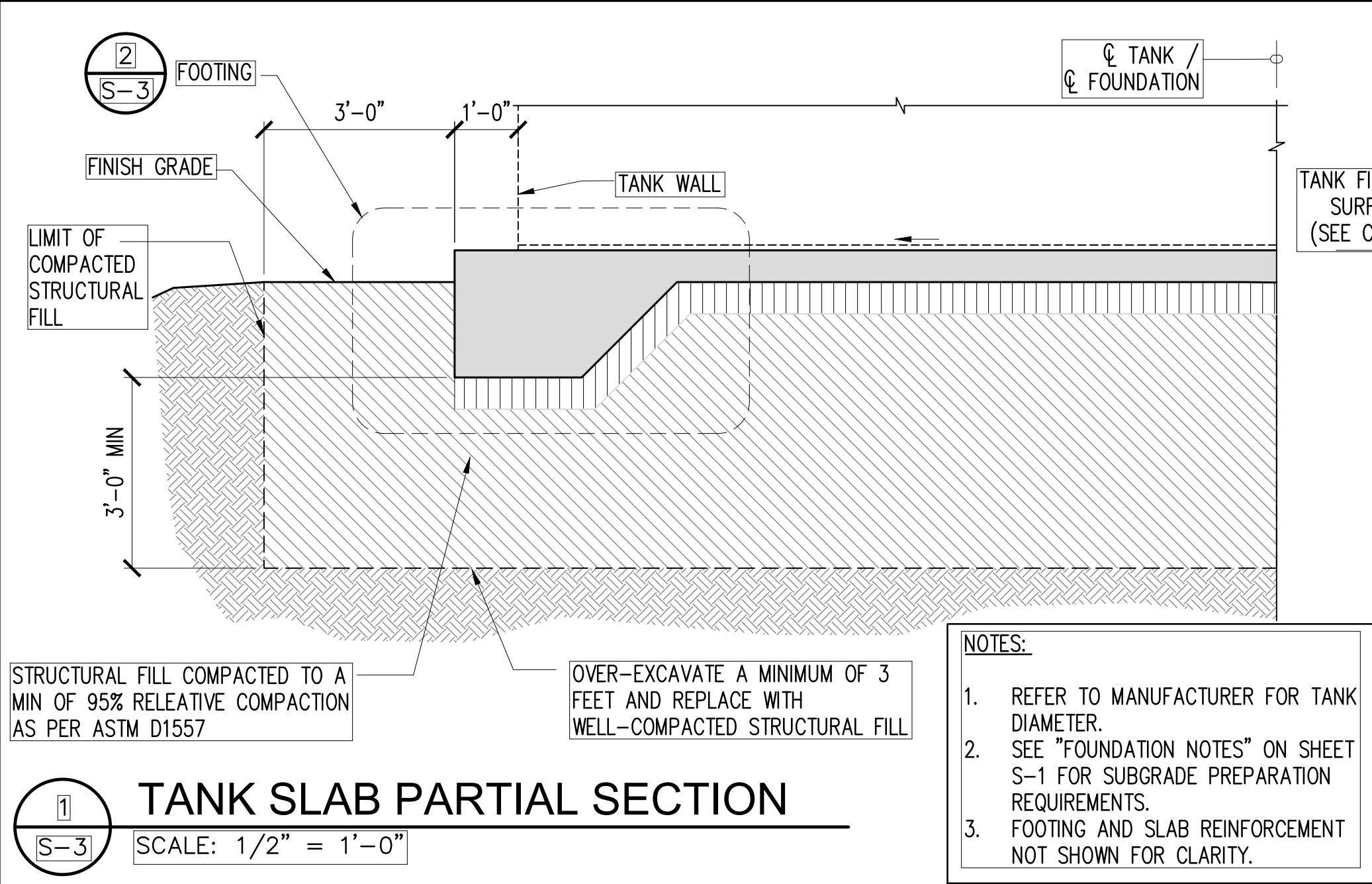
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- NOTES:
- PIPES ARE SHOWN FOR VISUAL REFERENCE ONLY, COORDINATE SLAB PIPE OPENINGS, PIPE SIZES, AND LOCATIONS WITH TANK MANUFACTURER AND CIVIL DRAWINGS.
 - SEE CIVIL DRAWINGS FOR FOUNDATION FINISH SURFACE ELEV.



REVISION DATE	DESCRIPTION	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS HONOKAI'A NON-POTABLE WATER SYSTEM TAX MAP KEY: (3) 4-6-013:002-046 HONOKAI'A, HONOKAA, ISLAND OF HAWAII			
TANK FOUNDATION PLAN			
Approved: _____ COUNTY ENGINEER, DPW, COUNTY OF HAWAII			
[AKINAKA & ASSOCIATES, LTD.] CONSULTING ENGINEERS			



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DEPARTMENT OF HAWAIIAN HOME LANDS HONOKAI'A NON-POTABLE WATER SYSTEM TAX MAP KEY: (3) 4-6-013:002-046 HONOKAI'A, HONOKAA, ISLAND OF HAWAII			
TANK FOUNDATION DETAILS			
Approved: <i>Jerry S. Fujita</i> COUNTY ENGINEER, DPW, COUNTY OF HAWAII			
[AKINAKA & ASSOCIATES, LTD.] CONSULTING ENGINEERS			